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ABSTRACT

A total of 298 children defined as corrective and remedial were in Listen Look Learn (LLL) classes during 1967-68. Available as controls were 104 children of a similar type, according to the cooperating school administrators; the latter were in classes which used basal materials. The largest group of children, and the group for which reasonably appropriate controls were available, were first- and second-grade children who took the reading subtests of the Stanford Achievement Test (SAT), Primary I, and the Cooperative Primary Tests, Listening. For this sample, treatment effect (LLL or basal group) was significant favoring LLL children for three of the four subtests of the SAT. Reading ability, defined as above or below the sample median, showed a significant difference on all four subtests and favored those children above the median level. There was a significant difference due to sex and favoring girls for three of the four subtests. Tables and graphs are included. (Author/BT)

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Evaluation of Listen Look Learn Cycles R-40 in Corrective and Remedial Installations, 1967-68

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I

INTRODUCTION

During the 1967-68 school year, the *Listen Look Learn* system was tested in eight corrective and remedial installations. A total of ten experimental (LLL) and seven control (basal reading programs) classes were involved.

In general, the children in these groups were reading at least one year below expectancy, the IQ level was average or below average, and in many cases the children were considered by teachers and school administrators to be educationally deprived or to have learning problems. In most installations, the children with the most severe reading problems were selected to participate in the experimental classes which meant that selecting a control group was difficult or impossible. In general, children with the most severe problems were assigned to the LLL classes and less severe problem learners made up the control classes. Often the children in LLL were emotionally disturbed or had behavior problems for which no control was possible and for which no statistical equating was possible.

An overall comparative analysis of objective data was performed which tested the relative effectiveness of the LLL system against basal programs for children who, because of age and grade level, could be appropriately tested by the *Stanford Achievement Test*, Primary I, Reading Tests. A second comparative analysis was performed for students who could appropriately be tested by the *Stanford Achievement Test*, Primary II. No comparative analysis could be performed for children who were tested on the *Stanford Achievement Test*, Intermediate I since no acceptable control classes were available. Instead, an analysis of change scores was conducted for this latter group. The *Cooperative Primary Tests*, Listening, was also administered to all children in an attempt to determine how effective the LLL system would be with the defined population with respect to developing listening ability. The *Cooperative Primary Tests*, Listening, Form 12B, which is suggested for use with first- and second-grade children, requires that the child listen to a verbal stimulus, either a word or a sentence, and make a response that is either in direct response to the stimulus or related to it in some way. For example,

in an early item the stimulus, "The cow is being milked," requires that the child mark a drawing of a cow being milked. The later items are far more sophisticated and require the child to recognize relationships. For example, the correct response to "Dottie is going to plant part of her apple. She will watch it grow," is a picture of apple seeds. This test then requires that the child not only listen carefully to verbal directions and be able to decode and encode these directions, but also have had the experience to make meaningful analogies possible. In other words, it is difficult because of the nature of the task required by the test to make generalizations that this test actually isolates the listening skill. However, since it is one of the newer and better tests of this type, it was utilized in this study.

System effectiveness was defined, for the purpose of these analyses, to be the levels of achievement attained by experimental and control children. Analysis of data was done utilizing Analysis of Covariance and factorial designs. Three covariates were used to statistically equate groups on initial existing differences. Analysis of Covariance is commonly used for this purpose when intact groups are used. For these analyses, groups were equated on IQ, age, and time spent per day on the total language arts program.

A certain amount of improvement should be expected for the experimental group from the pretest to the posttest due to the regression effect since these children were selected for corrective and remedial classes because they were below average with respect to achievement. They would be expected, therefore, to regress toward the mean on a second test. Control classes were selected on the same basis, however, so the regression effect should be essentially the same for both groups.

A second section of this report considers each installation separately. This was done in an attempt to determine the effectiveness of the LLL system in the separate installations. This type of analysis is less generalizable to a total defined population because sample size is often small. It was important, however, to determine if one type of remedial student, an educationally deprived child for example, would respond in an entirely different way to the LLL system than would a child from a middle-class area who also has a serious underachievement problem.

Subjective evaluation of the LLL system is also reported in the section devoted to the individual installations. It was included in this section because it is more meaningful to examine the teacher's evaluation of student achievement and student growth and teacher reaction to classroom management of the LLL system in conjunction with the objective evaluation for each particular installation.

The school year, the time period during which the LLL installation was actually using the LLL system, was atypical for several of the installations. One class used the LLL system for nine months and one installation used the system for only nineteen weeks. According to the administration manual for the *Stanford Achievement Test,* Primary I Battery however,

> The grade placement for any testing date may be determined..... If a school year is atypical, grade placement should be determined by computing the number of tenths of a school year which have elapsed at the time the tests are administered.[1]

It can be assumed from this statement that norms for varying test administration dates are reasonably accurate.

---

[1] Directions for Administering, *Stanford Achievement Test*, Primary I Battery; Harcourt, Brace & World, Inc., New York, 1964. page 27.

II

THE LLL SYSTEM IN FIRST- AND SECOND-GRADE CORRECTIVE AND REMEDIAL INSTALLATIONS

Thirteen groups of second-grade students, and one group of first-grade students who were repeating grade one, were tested in January of 1968 and began corrective and remedial instruction in language arts in either the experimental classes (LLL system) or the control classes (basal reading programs). One hundred and two children used the LLL system and eighty-one children used traditional basal materials.

The children were selected for special help in language arts at the discretion of the classroom teachers. This selection was the result of factors such as reading scores one or more years below average, low-ability levels, or learning disabilities and problems of underachievement (achievement below that level expected according to the child's ability level).

Four subtests of the *Stanford Achievement Test*, Primary I, Reading Tests, the *Otis-Lennon Mental Ability Test*, Elementary I Level, and the *Cooperative Primary Tests*, Listening, were administered to the total sample.

In general, the LLL groups used all segments of the LLL system. When additional or supplementary materials were used by teachers, the materials are listed in the section

dealing with individual installations. The control groups used whatever basal materials were being used in the classrooms prior to the beginning of the experiment. Four control groups used the Scott Foresman materials, two used Houghton Mifflin, and one group used the Bank Street Readers. Supplementary materials used by control classes included the S.R.A. materials; Phonetic Keys to Reading, Economy; Easy Growth in Reading, Winston; Reading for Independence, Scott Foresman; Word Cards and Phonic Picture Cards, Bank Street Publishing; Basic Reading, Lippincott; and My Weekly Reader, American Educational Publishing.

Both experimental and control groups were provided language arts instruction for periods ranging from nineteen to thirty-six weeks. At the end of this time, the Word Reading, Paragraph Meaning, Vocabulary, and Word Study Skills subtests of the *Stanford Achievement Test*, Primary I and the *Cooperative Primary Tests*, Listening, were administered. This data was analyzed by Analysis of Covariance and a 2 x 2 x 2 (LLL or control, by above or below median reading level for the sample, by sex) factorial design. The covariates used to statistically equate groups on initial differences were IQ, age of students, and number of weeks in the program.

Table I is a summary of the F-ratios (results of Analysis of Covariance analysis) and Error Mean Squares for this design. For the Word Reading subtest, highly significant results ($p < .01$ or the probability of these results occurring by chance is one time in

TABLE I

SUMMARY OF F-RATIOS AND ERROR MEAN SQUARES FOR THE ANALYSIS OF COVARIANCE[a] FOR FOURTEEN GROUPS OF CORRECTIVE AND REMEDIAL CHILDREN TO WHOM THE STANFORD ACHIEVEMENT TEST, PRIMARY I, READING TESTS AND COOPERATIVE PRIMARY TESTS, LISTENING, WERE ADMINISTERED

Source of Variation	df	Covariance Stanford Achievement Test Subtests: Word Reading	Paragraph Meaning	Vocabulary	Word Study Skills	Covariance Cooperative: Listening
Treatment	1	34.92**	4.84*	3.15	29.28**	1.21
Reading Ability[b]	1	46.34**	68.78**	15.65**	21.27**	2.61
Sex	1	9.05**	20.91**	.30	10.98**	.18
Treatment x Ability	1	.46	.51	.82	1.85	1.00
Treatment x Sex	1	.20	1.36	.75	2.42	1.56
Ability x Sex	1	1.37	.17	1.43	.59	1.71
Treatment x Ability x Sex	1	.25	1.03	2.12	.99	.50
Error Mean Square	169	34.06				
	169		53.19			
	139			18.51		
	170				66.33	
	170					22.44

[a] **Pintner-Cunningham Primary Test** administered in Fall, 1967.
[b] Defined for the purpose of this study to be above or below the sample median in reading ability.
* $p < .05$ (probability of these results occurring by chance is five times in one hundred replications of the experiment)
** $p < .01$ (probability of these results occurring by chance is one time in one hundred replications of the experiment)

one hundred experiments) occurred due to treatment effect, reading ability, and sex. Figure 1 is a graphical representation of these results. When the sample was divided according to sex and then according to reading ability for this subtest, it could be seen that, in general, each division of the sample indicated higher achievement levels attained by children who had used LLL materials. Both boys and girls from the LLL groups scored at a significant level ($p < .05$ or the probability of these results occurring by chance is five times in one hundred experiments) above boys and girls from control classes. Children with high reading ability (above the sample median) scored at a highly significant ($p < .01$) level above high-ability children from the control groups. Interaction effects, the relationships between posttest scores and two or more factors such as sex and ability, were not detected. This would be expected. It would be unlikely that low-ability girls from the control group would achieve at a significantly higher level than would high-ability boys from the control group, for example.

For the Paragraph Meaning subtest, column four in Table I, significant ($p < .05$) results favoring the LLL groups were found. Highly significant results ($p < .01$) favoring girls and children with high reading ability were found.

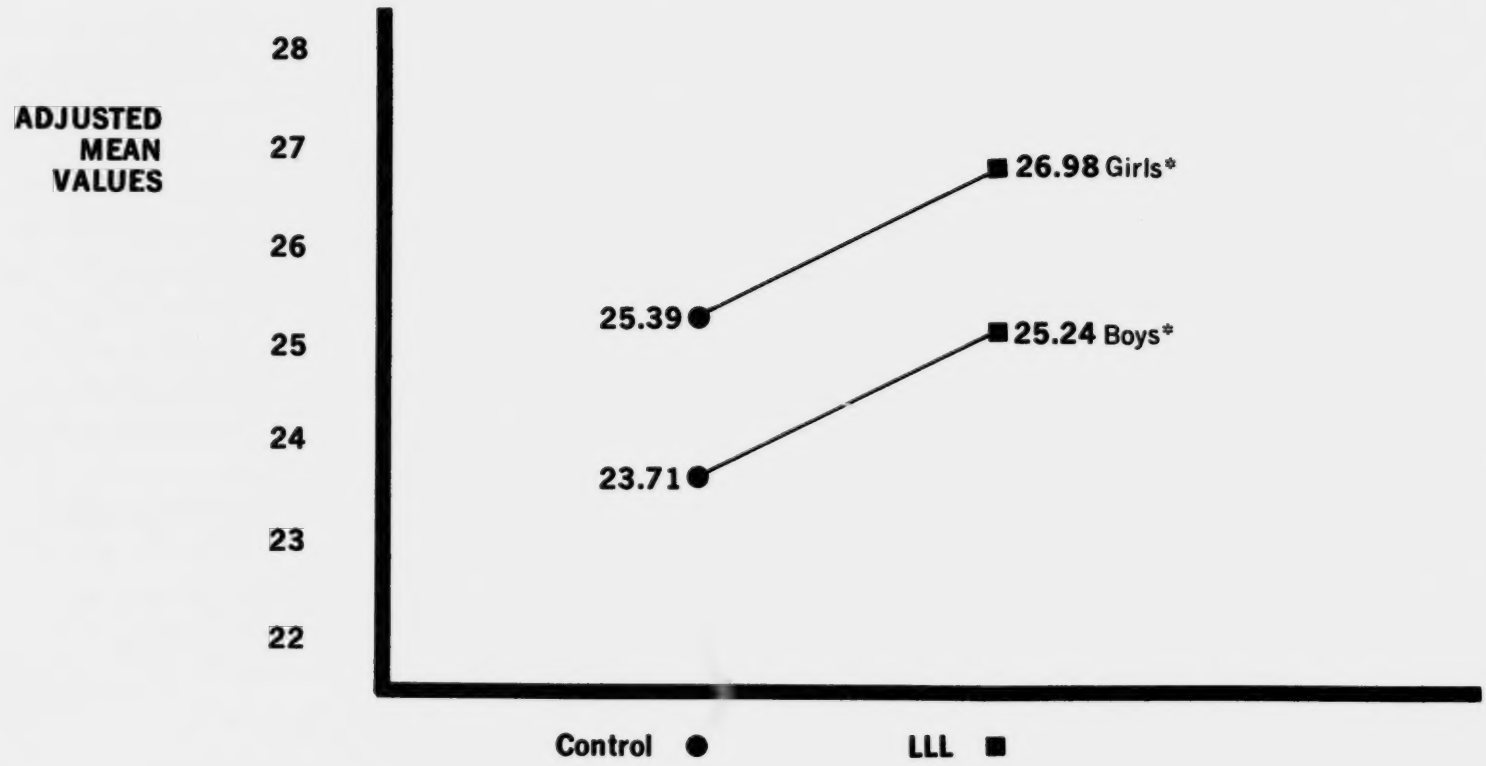
Figure 2 is the graphical representation of the results for this subtest. Girls from LLL groups scored at a level significantly above girls from control classes and it is apparent that LLL students, in general, scored at levels above those attained by control students regardless of the sample division.

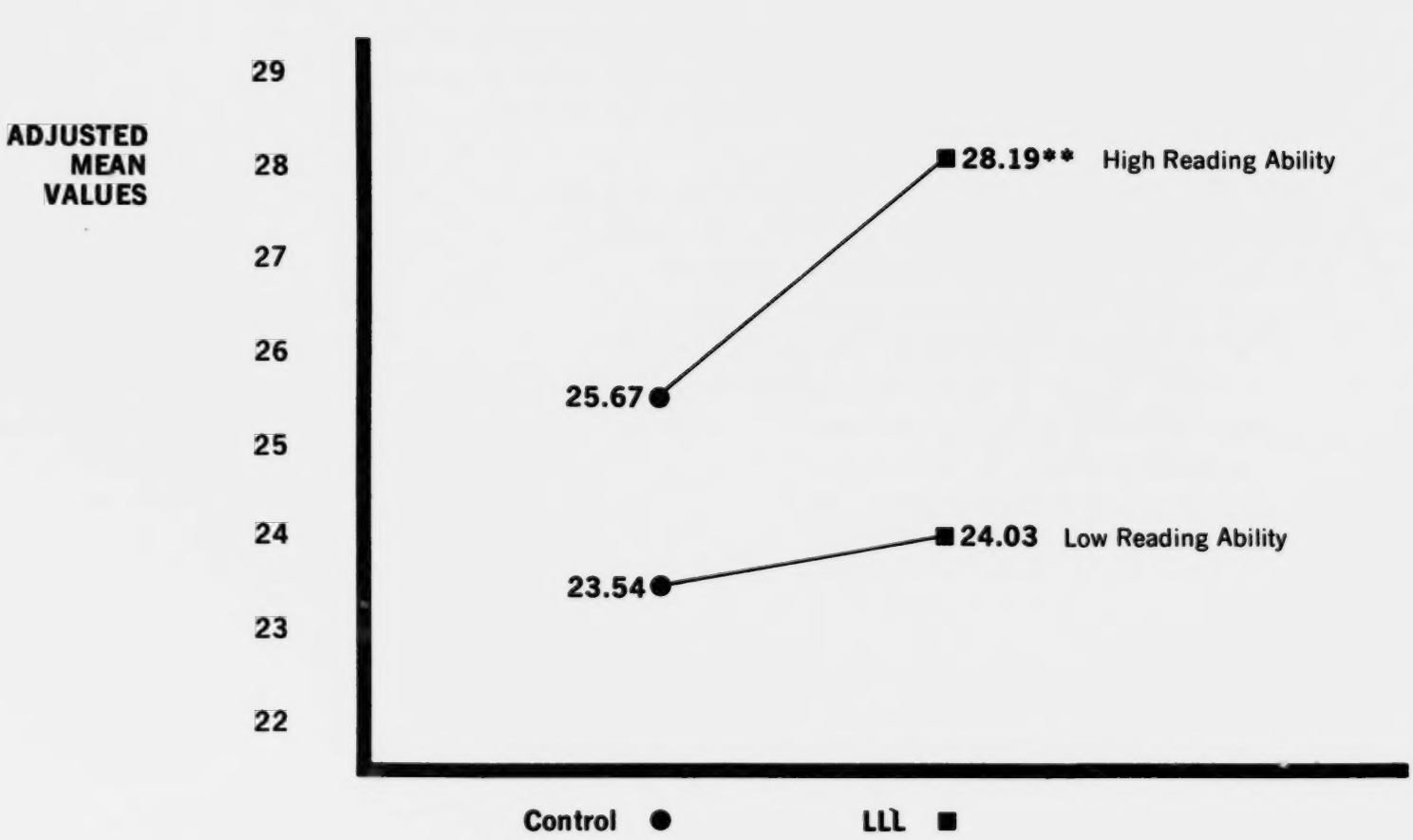
Column five of Table I gives the F-ratios obtained from the Vocabulary subtest. When the total sample was considered, the F-ratio resulting from treatment effect fell short of a significant level. However, when the sample was blocked on sex, it can be seen in Figure 3 that LLL girls scored at a highly significant level ($p < .01$) above control girls and, on the average, the boys from LLL groups scored slightly higher than control boys. There was a highly significant ($p < .01$) difference due to reading-ability level favoring children who scored above the sample median on reading tests. LLL students in both high-reading ability and low-reading ability groups scored significantly higher than the corresponding control students (see Figure 3). No difference due to sex and no interactions were detected.

The results for the Word Study Skills subtest are provided in column six of Table I. Highly significant ($p < .01$) results were obtained favoring the LLL groups. Results also favored girls and children with high reading ability at this level. Figure 4 is a graphical representation of these results. It is of interest to note that boys from LLL groups scored significantly above control boys for this subtest.

For the *Cooperative Primary Tests*, Listening, no significant results were detected. This means that both LLL and control children scored at essentially the same level on this test. These results are provided in column seven in Table I and in Figure 5.

In summary, the results obtained from this analysis are favorable to the LLL children. For three of the four *Stanford Achievement Test* subtests, the results obtained due to treatment could not be considered to be chance results. The effect of reading ability, favoring children who were initially above the sample median was an a priori assumption. The effect of sex, favoring girls, was not an unexpected finding. It is of interest to note that for two of the four subtests, boys from LLL groups scored significantly higher than did boys from the control groups. Young boys generally, and boys from this population specifically, have more serious learning problems than do girls. A possible reason for the positive results obtained may be the interest level attained and maintained by boys in the instrumentation inherent in the LLL system.

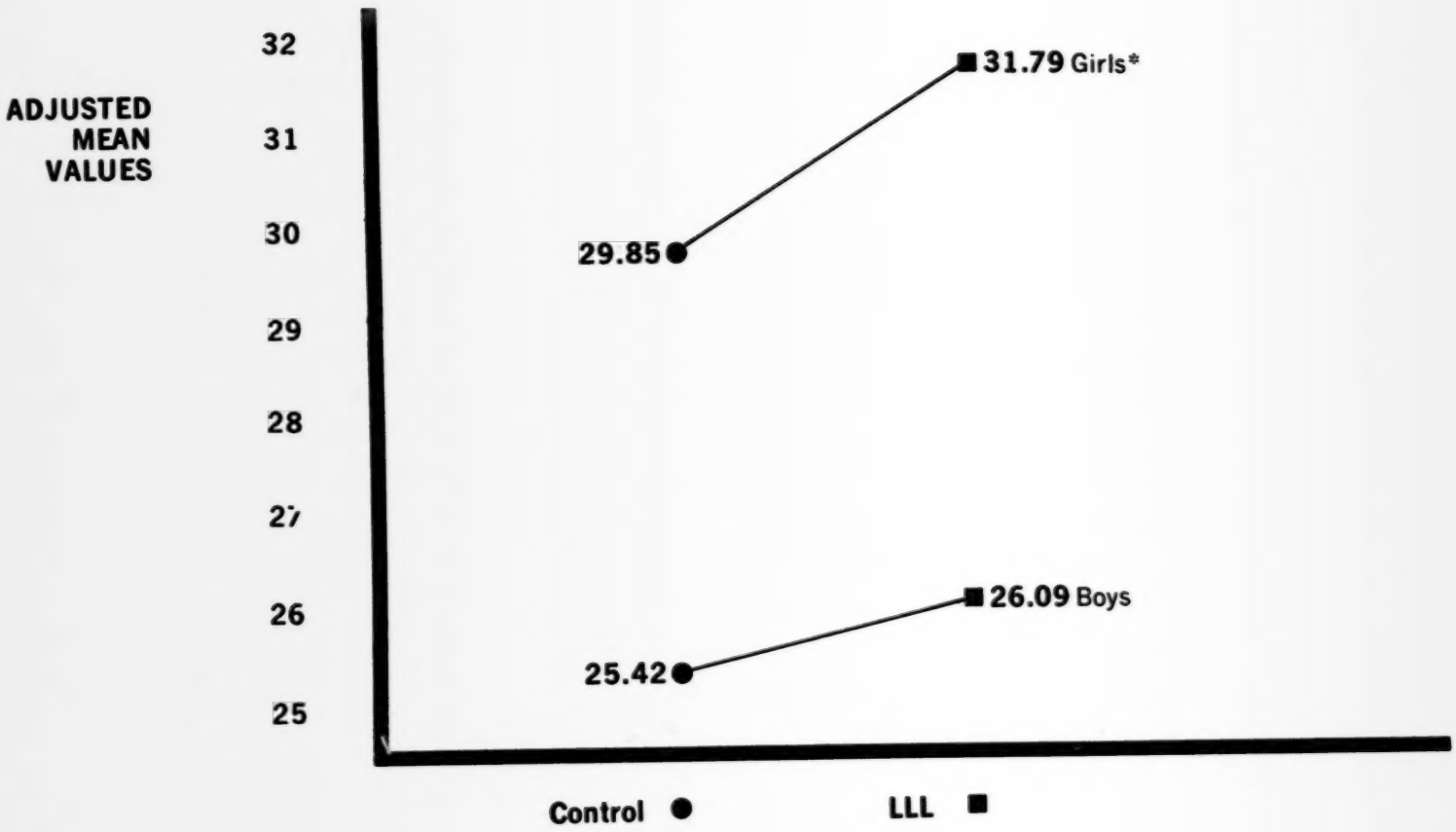


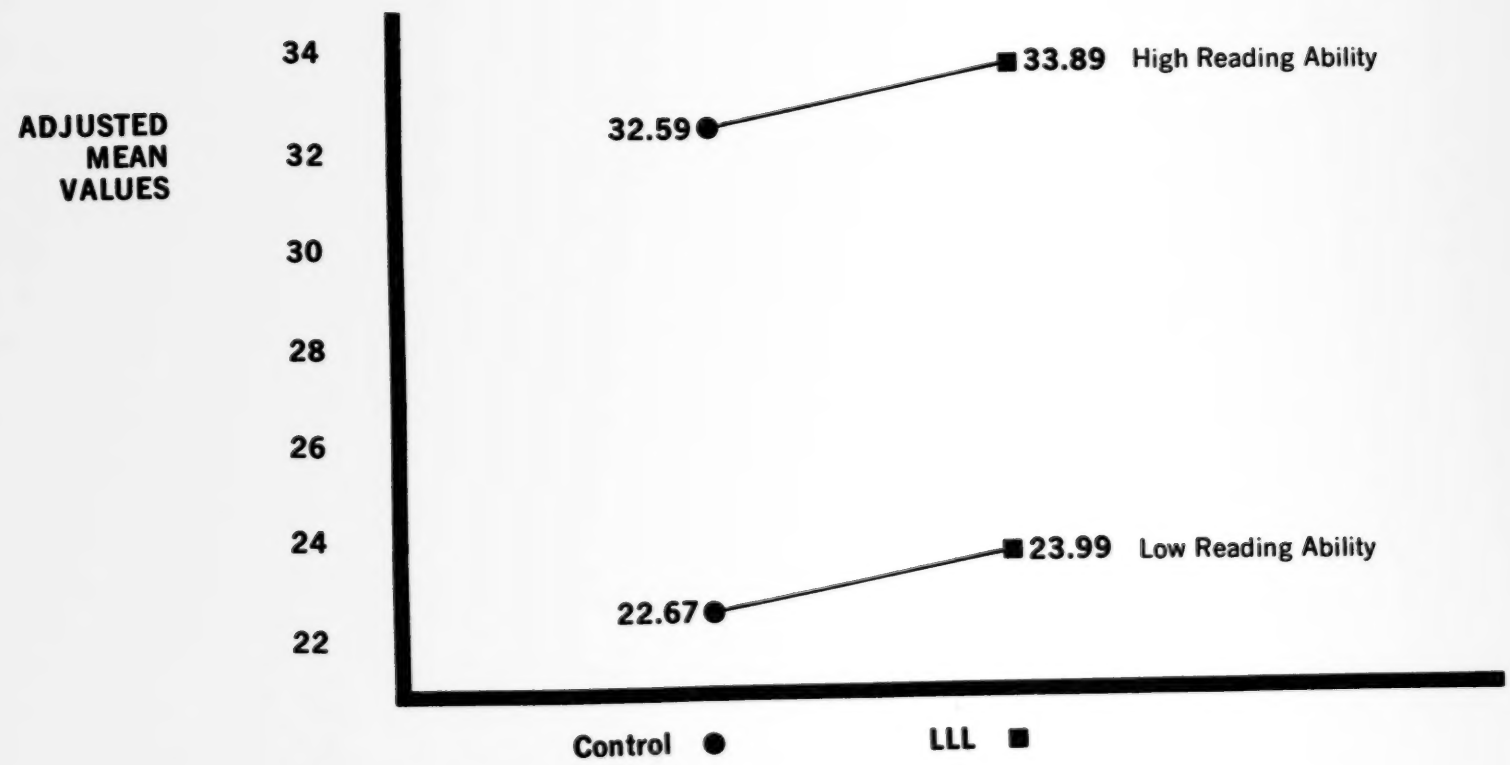


* LLL group favored at .05 level
** LLL group favored at .01 level

Graphical Representation of Achievement for the Word Reading Subtest of the Stanford Achievement Test, Primary I

Figure 1.

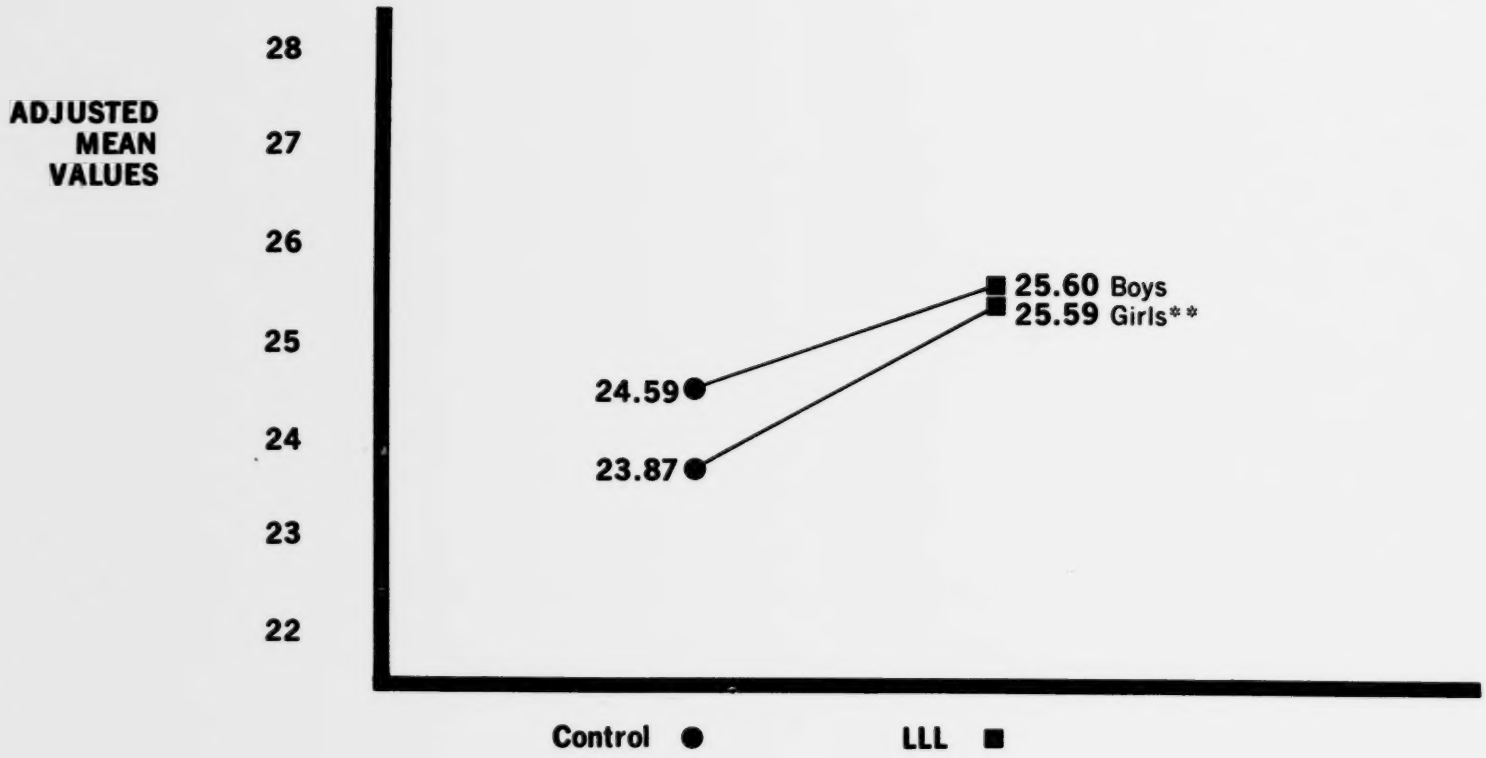


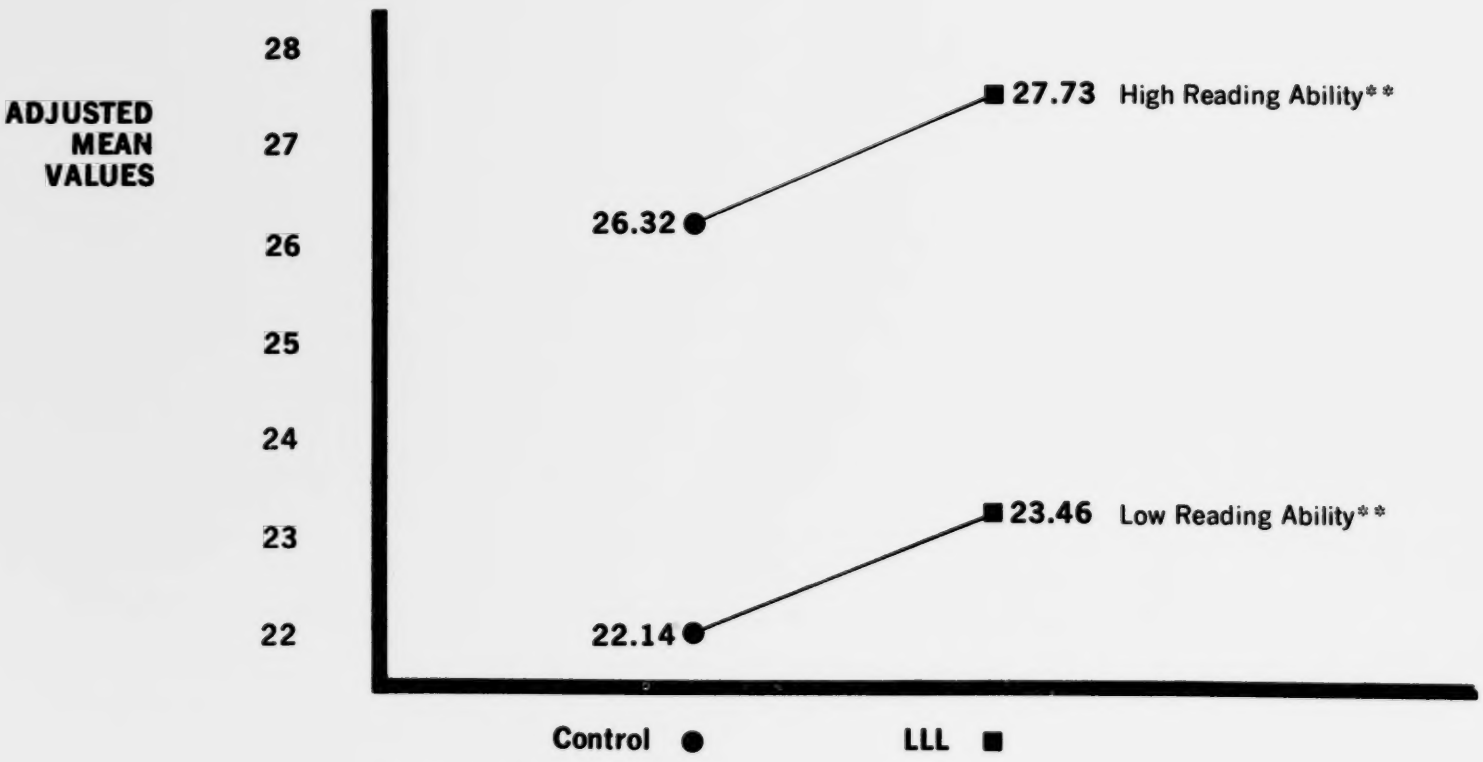


* LLL group favored at .05 level

Graphical Representation of Achievement for the Paragraph Meaning Subtest of the Stanford Achievement Test, Primary I

Figure 2.

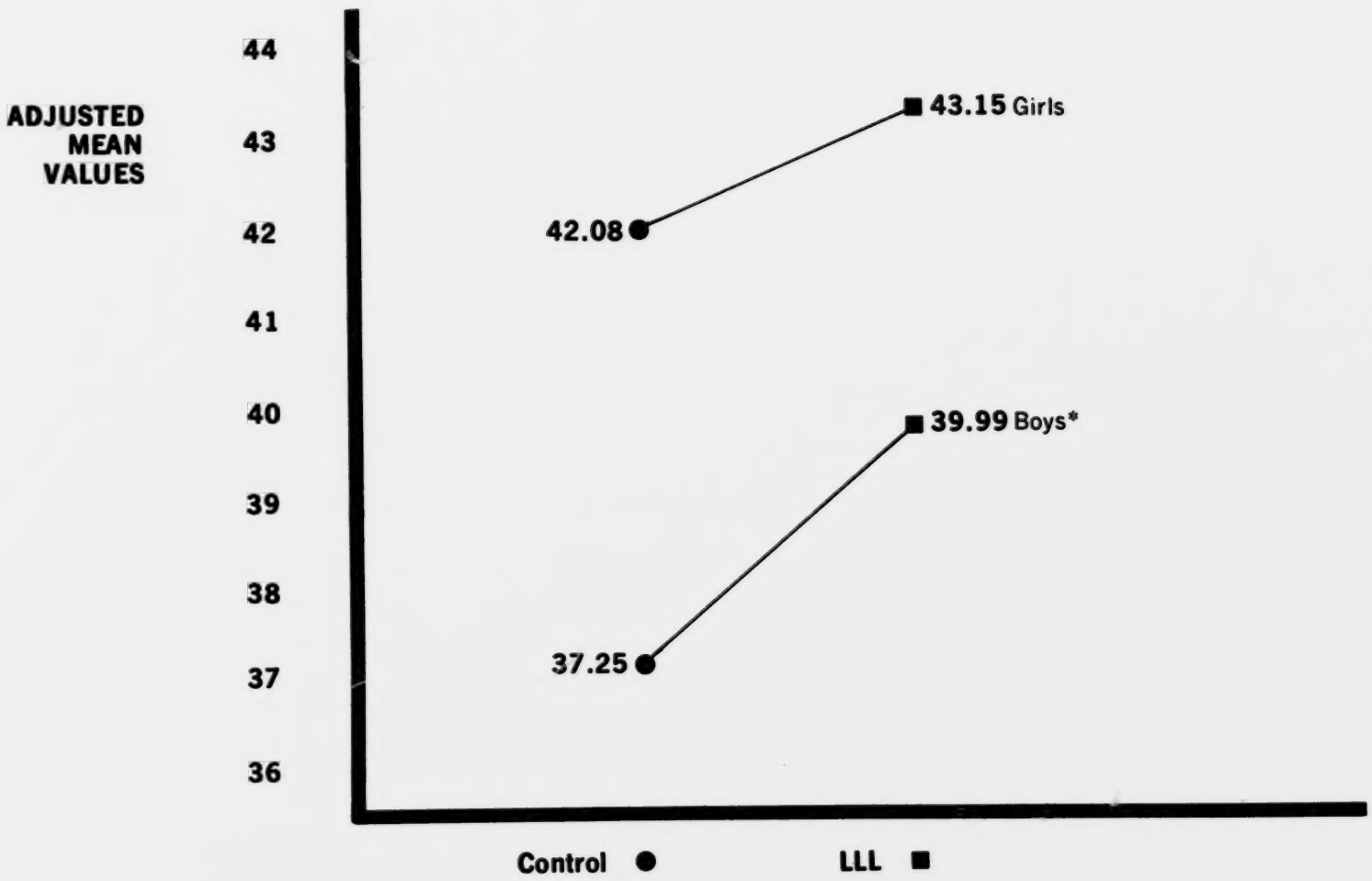


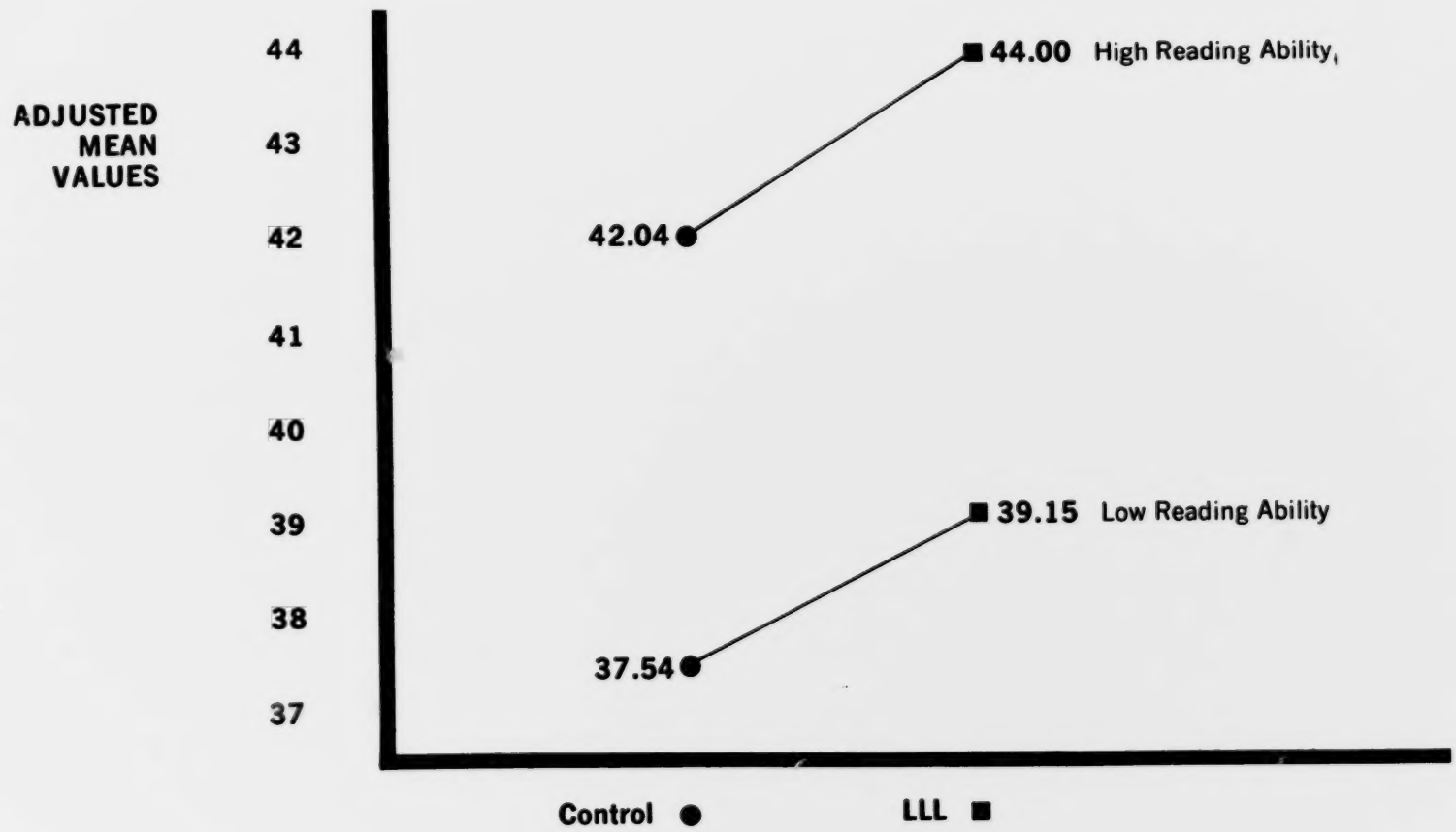


** LLL group favored at .01 level

Graphical Representation of Achievement for the Vocabulary Subtest of the Stanford Achievement Test, Primary I

Figure 3.

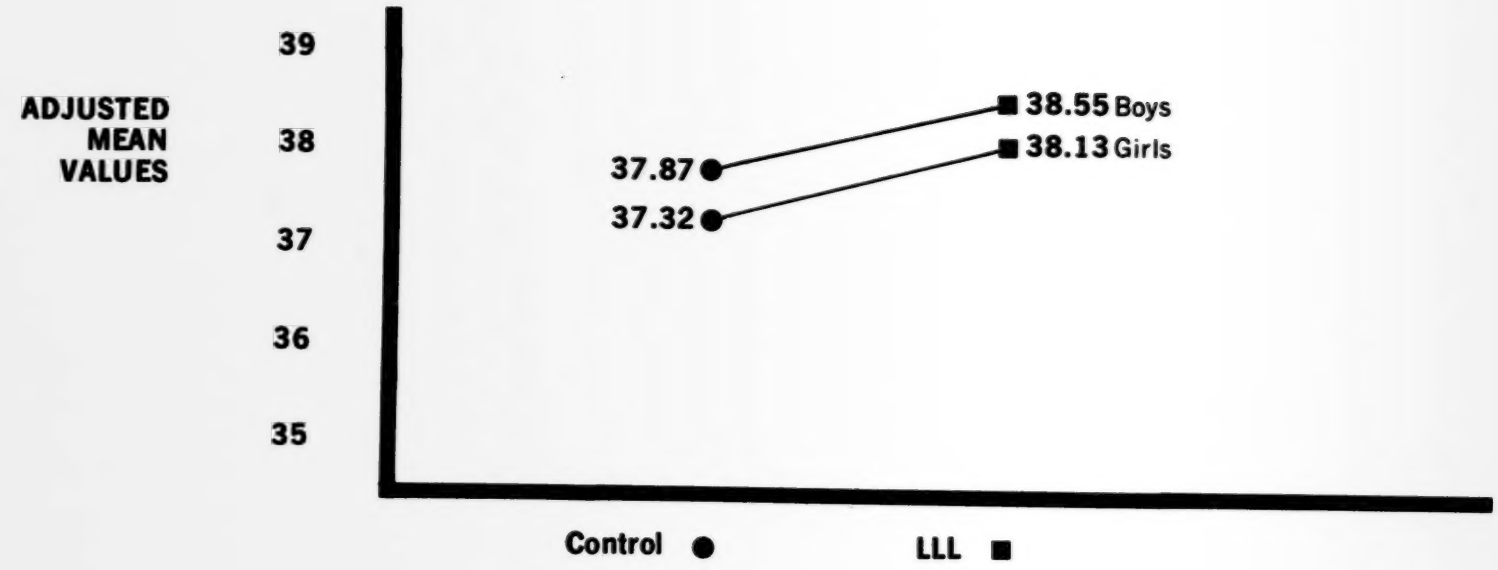


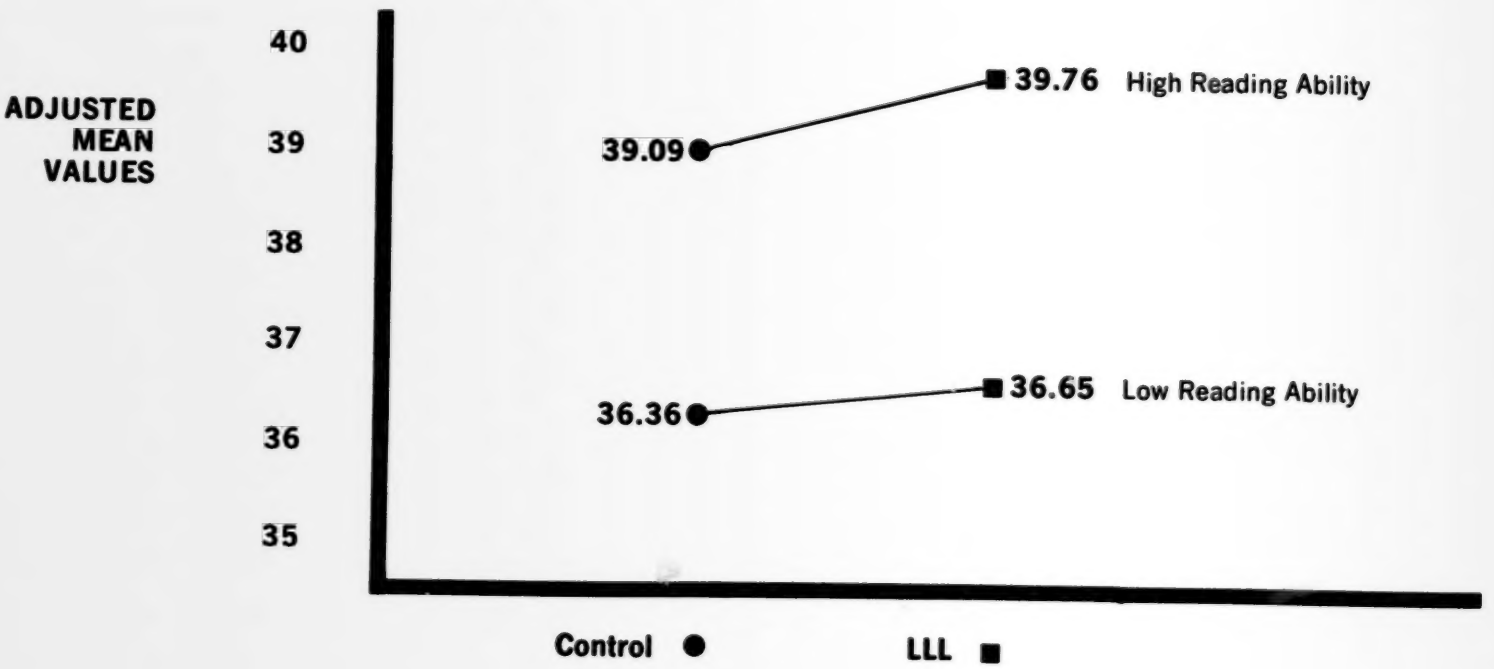


* LLL group favored at .05 level

Graphical Representation of Achievement for the Word Study Skills Subtest of the Stanford Achievement Test, Primary I

Figure 4.





Graphical Representation of Achievement for the Cooperative Primary Tests, Listening

Figure 5.

III

THE LLL SYSTEM IN AN INNER CITY EDUCATIONALLY DISADVANTAGED AREA

Two classes, one experimental and one control group, were established as research installations in a Chicago inner city or ghetto area. Twenty children were in the control group and thirty-three were in the experimental group. The experimental group used the LLL system and the control group used the *Curriculum Foundation Series*, Multi-Ethnic Edition, published by Scott Foresman and Company.

The area in which these classes were located could definitely be termed an educationally disadvantaged one. The school principal defined the neighborhood as extremely depressed. He estimated that 75 per cent of the families were on some type of public assistance and 75 per cent of the children did not have fathers living in the home. Entering first-grade student's (1967) scores on the *Metropolitan Readiness Test* indicated

to the school staff that 76 per cent of the children had little or no chance to succeed in the primary reading program.

The LLL group began with Readiness Stages in the fall of 1966. The teacher allowed the students to proceed at their own individual rate. In May of 1967, the most advanced child in the class had reached Cycle 6. During the second year of the study, the children in the experimental group continued with the sequences of the LLL system. By May of 1968, the LLL students ranged in cycle placement from 10 to 34 and the average cycle completed was more than 19. The control class continued in the basal reading program during this two-year period.

Pintner-Cunningham IQ tests were administered in the fall of 1966 and the fall of 1967. Although sample size is far too small to provide generalizable results, the scores are of interest. The control students scored at an average of 110.06 in 1966, but the average score for the group dropped to 101.29 in 1967, which represents a loss of approximately .6 of a standard deviation. The LLL students during the same time period and, theoretically, in the same school milieu, scored 88.14 on the average in 1966, and 97.43 on the average in 1967, which represents a gain of approximately .6 of a standard deviation.

Subtests of the *Stanford Achievement Test*, Primary I and the *Cooperative Primary Tests*, Listening, were administered in May, 1968, to the LLL and control groups.

Analysis of Covariance and a 2 x 2 (LLL or control by sex) factorial design were utilized to analyze the data. Table II is a summary of this analysis.

TABLE II

F-RATIOS AND ERROR MEAN SQUARES FOR THE ANALYSIS OF COVARIANCE[a] FOR FIFTY-THREE CHILDREN TO WHOM THE STANFORD ACHIEVEMENT TEST, PRIMARY I, READING TESTS AND COOPERATIVE PRIMARY TESTS, LISTENING, WERE ADMINISTERED

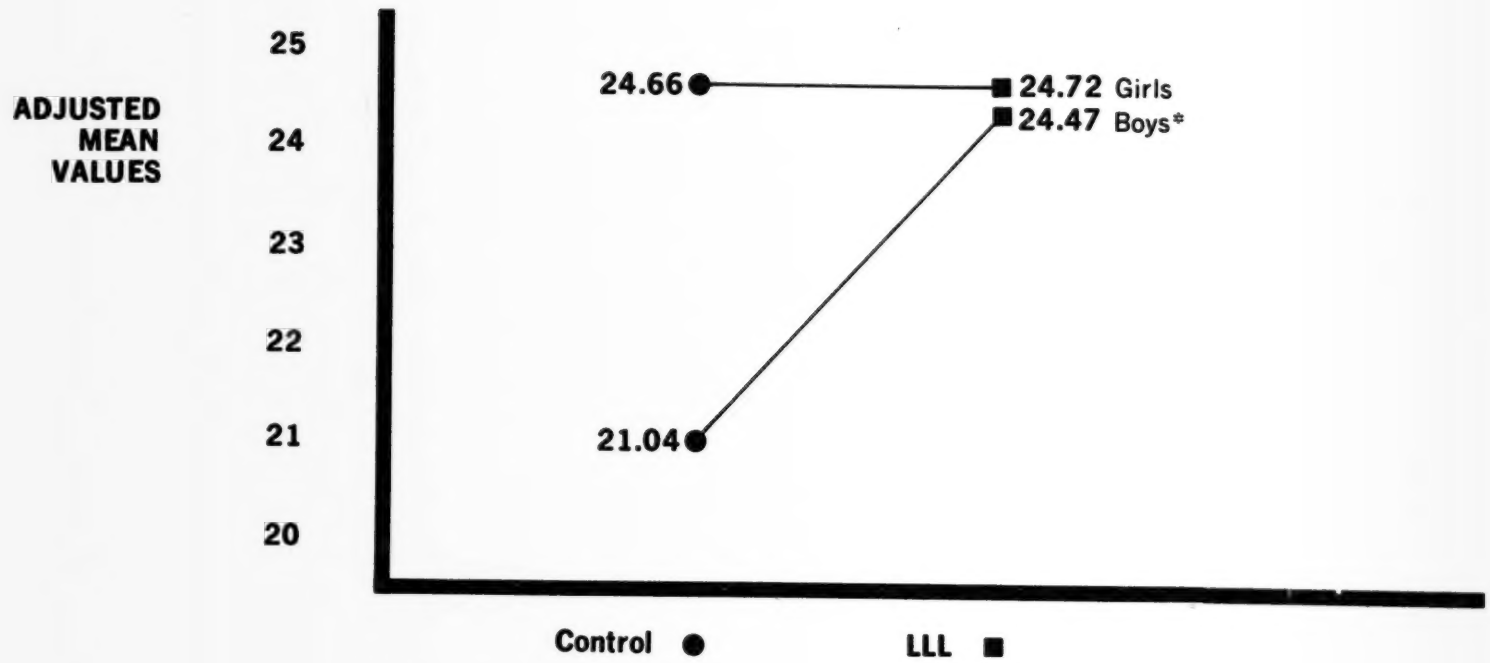
		Covariance	Covariance	Covariance	Covariance	Covariance
		Stanford Achievement Test Subtests				Cooperative
Source of Variation	df	Word Reading	Paragraph Meaning	Vocabulary	Word Study Skills	Listening
Treatment	1	.86	7.74**	28.93**	2.67	5.24**
Sex	1	1.04	.26	.21	.78	5.42**
Treatment x Sex	1	2.82*	2.14	1.28	.02	7.16**
Error Mean Square	49	40.85				
	49		70.75			
	47			21.29		
	47				92.15	
	47					13.23

[a] **Pintner-Cunningham Primary Test** administered in Fall, 1967.

* $p < .05$ (probability of these results occurring by chance is five times in one hundred replications of the experiment)

** $p < .01$ (probability of these results occurring by chance is one time in one hundred replications of the experiment)

An examination of the results of each test follows. Figure 6 is a graphical representation of the results of the Word Reading subtest. Column three in Table II indicates no significant differences due to treatment. If the boys' and girls' results are examined separately, however, it is obvious that the boys in the LLL group scored at a significant level ($p < .05$) above boys in the control group. Table II also shows that treatment by sex interaction was significant ($p < .05$) which means that boys scored at a significantly different level if they had LLL rather than a basal program but girls scored at essentially the same level regardless of treatment.

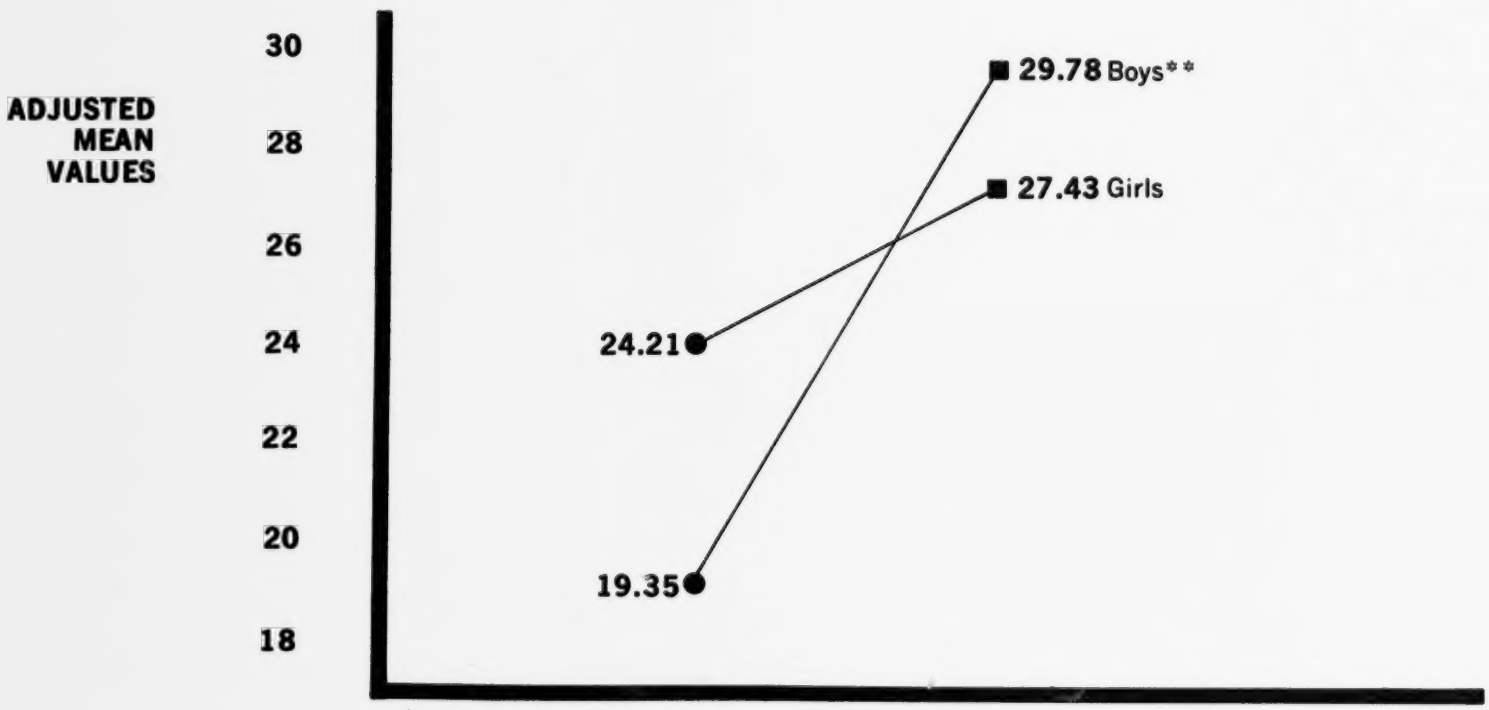


* LLL group favored at .05 level

Graphical Representation of Achievement for the Word Reading Subtest of the Stanford Achievement Test, Primary I

Figure 6.

Figure 7 is a graphical representation of the results of the Paragraph Meaning subtest. Column four in Table II shows that the LLL group scored at a highly significant ($p < .01$) level above the control group for this subtest. When the results achieved by boys and girls were examined, it was found that LLL boys scored at a highly significant level ($p < .01$) above control boys and LLL girls scored at a higher level than control girls although not significantly so. No other significant values were detected.

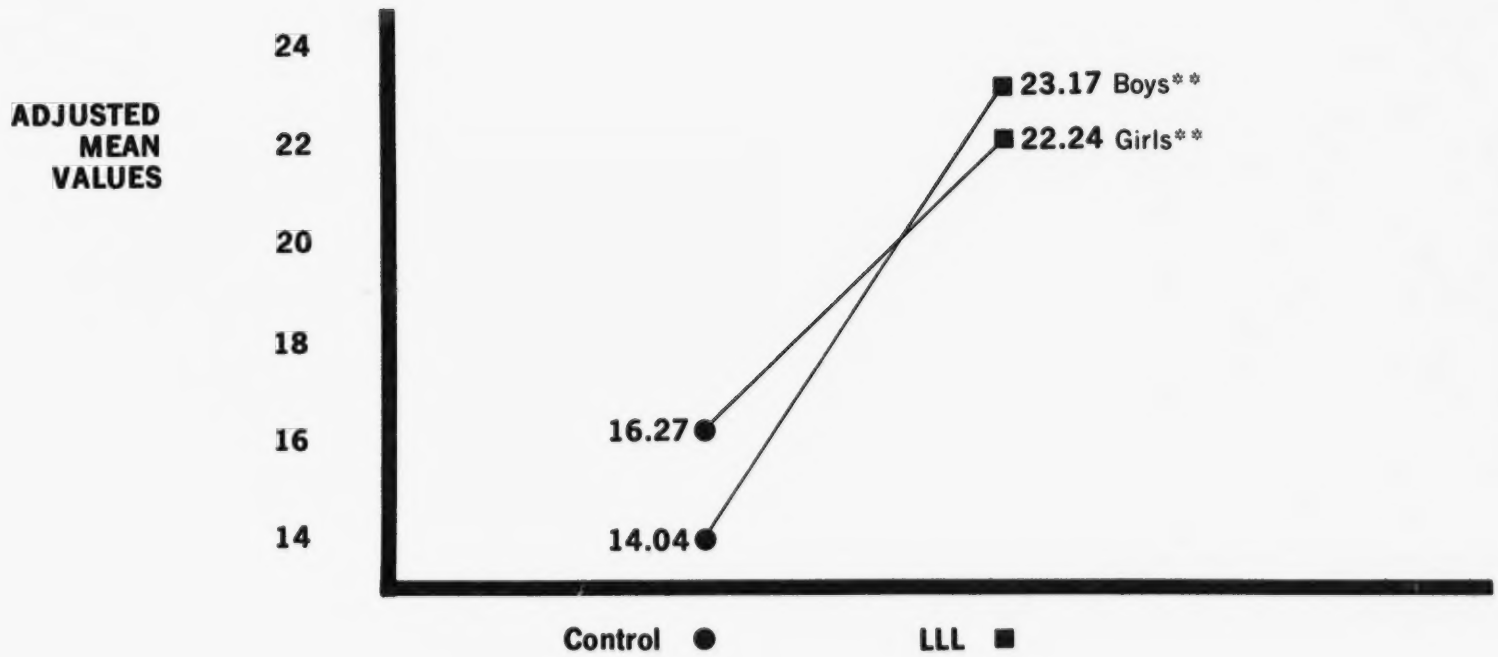


** LLL group favored at .01 level

Graphical Representation of Achievement for the Paragraph Meaning Subtest of the Stanford Achievement Test, Primary I

Figure 7.

Figure 8 is a graphical representation of the results of the Vocabulary subtest. Column five in Table II shows that the total LLL group scored at a highly significant ($p < .01$) level above the control group and both boys and girls scored at a highly significant level above corresponding boys and girls from the control group when these results were examined separately. Differences due to sex did not occur which means that LLL and control boys and girls achieved at essentially the same level and no significant interaction was detected.

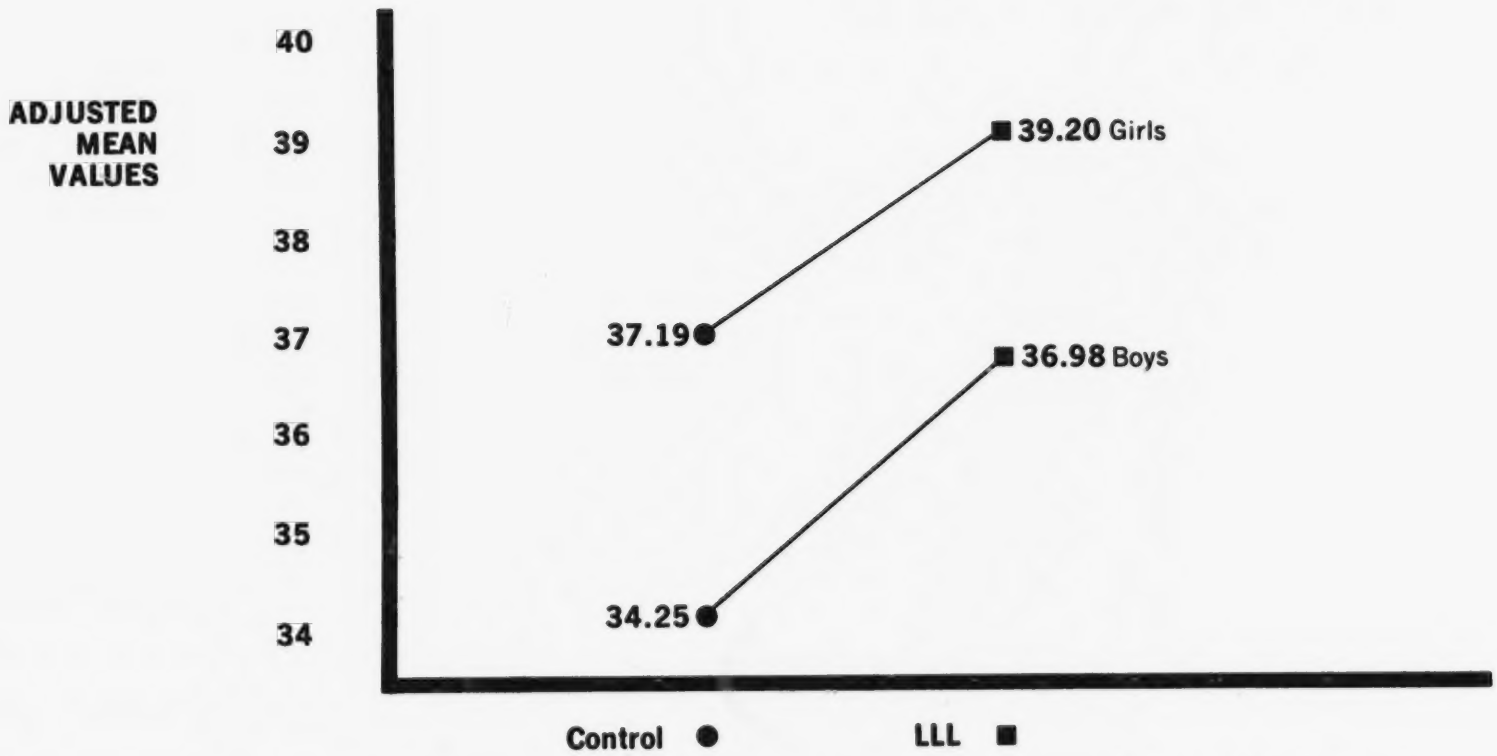


** LLL group favored at .01 level

Graphical Representation of Achievement on the Vocabulary Subtest of the Stanford Achievement Test, Primary I

Figure 8.

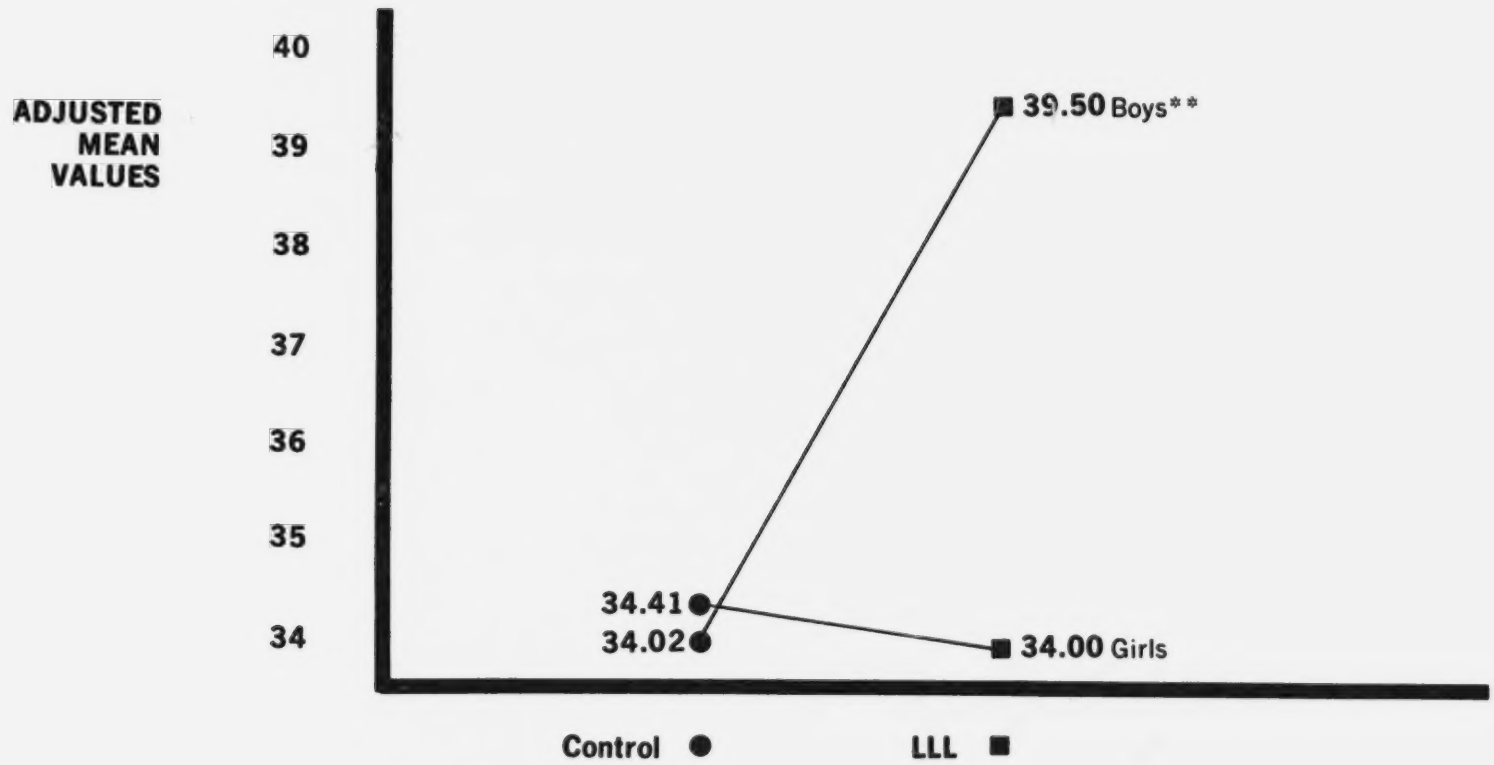
Figure 9 is a graphical representation of the results of the Word Study Skills subtest. Column six in Table II shows that the F-ratio for LLL versus control group treatment effect fell slightly below the value required for significance, although it can be seen in Figure 9 that both boys and girls from the LLL group scored well above the corresponding groups of boys and girls from the control group. Table II also shows that boys and girls in the LLL and control groups did not score at essentially different levels and therefore, neither sex nor treatment by sex F-ratios were significant.



Graphical Representation of Achievement for the Word Study Skills Subtest of the Stanford Achievement Test, Primary I

Figure 9.

Figure 10 is a graphical representation of the results on the *Cooperative Primary Tests*, Listening. Column seven in Table II shows that the treatment effect (LLL or control) was significant and the LLL group was favored at a highly significant ($p < .01$) level. This significant result is obviously due to the achievement level of the boys in the LLL group since girls scored at approximately the same level regardless of treatment. The F-ratio resulting from the effects due to sex was highly significant ($p < .01$) as was the interaction effect. This is confirmed and demonstrated by Figure 10 which shows the large difference in Listening test scores of LLL boys above control boys (significant at the .01 level).



** LLL group favored at .01 level

Graphical Representation of Achievement for the Cooperative Primary Tests, Listening

Figure 10.

Reading rates, based on Controlled Reader setting for selections in which at least 70 per cent comprehension was achieved by the children, were provided by the teacher. Table III is a summary of the average reading rates attained by children in each of the cycle placement groups. Although the sample is small, there is the indication of a trend for reading rate to increase as the student progresses through more cycles of instruction which can probably be attributed to the results of the Controlled Reader training. It appears from the data that these children, although educationally underprivileged, were able to read at these rates with good comprehension. The average reading rate of 125.2 words per minute for this group of 31 students is comparable to the national average of 138 words per minute for third-grade students. These national norms were obtained from a sample of 8290 children considered to be representative of the total elementary school population (grades 1-6) in a national study (see EDL Research and Information Bulletin No. 3).

TABLE III

AVERAGE READING RATES FOR SECOND YEAR LLL CHILDREN IN CYCLES 10 THROUGH 34

Cycle Placement[a]	Number of Children	Words per Minute
10	10	82.1
12	4	102.5
13	3	117.6
19	6	147.0
24	5	164.0
34	3	180.6
	Total Sample = 31	125.2 = Average Words per Minute

[a] Data collected in May, 1968.

In summary, Table II provides the values obtained by the Analysis of Covariance for this sample of inner city children. On two subtests of the *Stanford Achievement Test* and on the Listening test, the children from the LLL group scored at a highly significant ($p < .01$) level above children from the control group. Sex was a significant factor in the Listening test as a result of the significantly higher level of achievement attained by boys in the LLL group. The interaction of treatment effect by sex effect was significant for the *Stanford Achievement Test*, Word Reading subtest, and for the *Cooperative Primary Tests*, Listening, which was the result in both cases of boys in LLL groups achieving at a significantly higher level above control boys, while girls achieved at essentially the same level regardless of treatment.

On a locally required and administered test, the school principal reported that children from the LLL group had achieved at an entirely satisfactory range. On the Word Knowledge subtest of the local test the LLL children scored in a range of 1.8 to 3.8 (grade equivalency) with a mean score of 2.7. On the Paragraph Meaning subtest the LLL children scored in a range of 3.2 to 5.6 with a mean score of 4.2.

The teacher of the LLL group was very well satisfied with the operation of the system and with the results achieved. She had two Aud-Xes and two Controlled Reader instruments in the classroom and had the children organized into six work groups. She

had no extra assistance of any type yet she felt that she was able to manage the classroom successfully. She also reported that she was both comfortable with the system and enjoyed using it. She reported that the Aud-X instruments were quite dependable and that small groups working with the Aud-X seldom required supervision. She rated the LLL system as superior to any other program with which she had previously had experience and wrote that she would like to use the system the following year. Her specific comments regarding the results of the LLL system are as follows:

1. Children are developing a sense of independence.
2. Effort, interest, individual growth and achievement have been in proportion to a child's ability.
3. Children are becoming receptive and enthusiastic toward learning.
4. Children are developing a sense of pride in doing a job well.
5. Parents have begun to complement and/or supplement classroom assignments.
6. Children have begun to see the relationship between isolated skills and their practicality.
7. The *Listen Look Learn* system is geared toward individualizing instruction.

In summary, it is apparent that the results of the Chicago inner city experiment definitely favored the LLL group from the standpoint of objectively measurable achievement of the children, attitudinal and motivational growth of the children, and satisfaction of the teacher in the areas of student growth and development and classroom management.

IV

THE LLL SYSTEM IN THREE READING LABORATORY INSTALLATIONS

Three reading laboratories were established in Louisiana to provide supplementary and remedial instruction for children in three separate elementary schools. Twenty-eight per cent of the children were judged by the teachers to be of a middle socioeconomic status and the remainder were judged to be of a lower socioeconomic status. This judgment was based on education, income, and occupation of the head of the household. The basis for selection of these children included the following: children from grades one through four could be referred to the reading laboratory; the child should be within or above the average range of ability, and the child must be one or more years below expectancy in reading.

Three teachers were involved in the project. All held bachelor's degrees and one had completed hours beyond the degree. All had more than five years of teaching experience but two of the teachers were teaching corrective and remedial reading for the first time during the 1967-68 school year.

The general plan for each reading laboratory was to select ten children from each grade level for this remedial instruction. First and second graders began in Readiness Stage 1 through Cycle 1, third and fourth graders began instruction in Cycles 10 through 15, at the discretion of the teacher, and fifth and sixth graders (not included in the research study) were placed in more advanced cycles according to their ability, determined by teacher evaluation. It should be noted that only Cycles R-40 were available at this time. The older children rapidly completed the available cycles and were then returned to basal reading programs.

All sections of the LLL system were used as time permitted, although Aud-X and Controlled Reader activities were used consistently. Additional materials used in the laboratories were the Webster New Practice Reader and the Barnell-Loft Specific Skill Series, and one group also used the Phonics in a Nutshell materials.

First- and second-grade students began using the LLL materials in the laboratory situation at approximately the beginning of the second semester. These students were in the lab for approximately ninety minutes each day. The majority of these children began working on the Readiness Stages. The most serious problems, according to the teachers,

were related to lack of background experience and inadequate vocabulary. The Picture Sequence Cards were used to correct these deficits. Individual children arranged cards and explained the action sequence to others within the group, or small groups would work out stories together. Aud-X lessons and Weston Woods filmstrips were used extensively to build experiences. For these children, motility and accuracy training segments of the program were sacrificed when time was limited because the teachers believed that experience building and skill building were vital at this stage of the childrens' development. The Listen and Write activities were used with the younger children. As each stage or cycle was completed, careful evaluation and review was provided for the individual child before he progressed to the next cycle. During the twenty-two weeks of laboratory operation, these students completed an average of nine cycles.

It would be assumed that an average child in a classroom would exhibit slightly more than four months' growth during this period of time. It is often the case, however, that remedial and corrective children show less than normal growth patterns during a school year.

Table IV is a summary of the growth patterns achieved by thirty-five first- and second-grade children who used the LLL system. T-test values, used to test the significance of change between the pretest and posttest scores, are also provided. This test was used to determine whether or not the change in scores achieved by the children was a change due to chance or a reflection of the treatment they received (LLL).

TABLE IV

SUMMARY OF CHANGE SCORES ON THE STANFORD ACHIEVEMENT TEST, PRIMARY I, READING TESTS AND COOPERATIVE PRIMARY TESTS, LISTENING, FOR THIRTY-FIVE CHILDREN IN THE LLL READING LABORATORY DURING A TWENTY-TWO WEEK PERIOD

	Stanford Achievement Test Subtests				Cooperative
	Word Reading	Paragraph Meaning	Vocabulary	Word Study Skills	Listening
Pretest (mean value)[a]	21.91	22.06	19.97	35.20	25.94
Posttest (mean value)[b]	28.03	30.71	24.63	41.34	33.42
Change in Grade Equivalents	5 mo.	6 mo.	6 mo.	4 mo.	
Change in Percentile Rank[c]					12th Percentile to 53rd Percentile
t-test	7.709**	12.192**	5.197**	7.620**	7.977**

[a]Administered in January, 1968.
[b]Administered in May, 1968.
[c]Corrected for fall and spring norms.
** $p < .01$ (probability of these results occurring by chance is one time in one hundred replications of the experiment)

Since these children were selected because they were poor students, a certain regression effect would tend to make posttest scores slightly higher than pretest scores as a result of this effect; however, the difference was greater than that which could be attributed to regression. It appears that the growth exhibited by LLL students was at an essentially normal rate or above which is an excellent pattern for this type of low-achieving student.

The three teachers involved were questioned about the classroom management of the LLL system. Each teacher worked in a laboratory setting with the assistance of one aide. Unfortunately, the aides were often unable to assume responsibility and there was frequent turnover among the aides. The teachers were not able, therefore, to depend upon them for assistance in classroom management. Each teacher reported that during the latter part of the school year supervision of Aud-X lessons by adults was seldom required and that the children were able to work successfully in small groups. The Aud-X instruments were reported to be quite dependable.

The older children were in the reading laboratories from forty-five to ninety minutes each day. Although all children attended the reading class each day the time per day was, to some extent, dependent upon the child's schedule of classes.

The older children used the Aud-X lessons and Controlled Reader regularly. Tach-X activities were stressed with this older group. The reading specialist in the district stated that many of these children recognized many words that they had learned previously by rote but they were unable to use the words in context. The Tach-X activities were very helpful in correcting this problem. The teachers also used the Picture Sequence Cards to correct this lack of usable vocabulary. Rather than explaining the activities suggested by the cards as younger children do, the older children wrote their version of the stories and were encouraged to use as many of the Tach-X and Aud-X words as possible in their stories.

Controlled Reader Jrs. were used by these children in carrels built into the laboratories. This activity was provided for both the low-achieving children who needed additional review and for the children who worked much more rapidly than the other members of their group.

Table V is a summary of the growth patterns achieved by those children who, as third- and fourth-grade students, were administered the reading subtests of the *Stanford*

TABLE V

SUMMARY OF CHANGE SCORES ON THE STANFORD ACHIEVEMENT TEST, PRIMARY II, READING TESTS AND COOPERATIVE PRIMARY TESTS, LISTENING, FOR FORTY-EIGHT CHILDREN IN THE LLL READING LABORATORY DURING A TWENTY-TWO WEEK PERIOD

	Stanford Achievement Test Subtests			Cooperative
	Word Meaning	Paragraph Meaning	Word Study Skills	Listening
Pretest (mean value)[a]	16.38	23.96	30.10	25.57
Posttest (mean value)[b]	20.83	33.15	35.52	31.68
Change in Grade Equivalents	4 mo.	6 mo.	5 mo.	
Change in Percentile Rank[c]				9th Percentile to 45th Percentile
t-test	7.120**	7.879**	6.434**	8.195**

[a]Administered in January, 1968.
[b]Administered in May, 1968.
[c]Corrected for fall and spring norms.
** $p < .01$ (probability of these results occurring by chance is one time in one hundred replications of the experiment)

Achievement Test, Primary II. These results appear to be very successful particularly for underachieving children of this age range who have developed well-established patterns of failure in their school careers.

Table VI is a summary of the reading rates determined by Controlled Reader settings for reading selections for which children achieved at least 70 per cent comprehension. Reading rates showed consistent growth rates as students completed more cycles.

TABLE VI

READING RATES FOR LLL CHILDREN AVERAGED OVER TEN CYCLE INTERVALS

Number of Cycles Completed[a]	Number of Children	Words per Minute
1—10[b]	15	74.8
11—20	11	83.6
21—30	10	142.0
31—40	0	0
	Total Sample = 36	96.1 = Average Words per Minute

[a]Data collected in May, 1968.
[b]Six children in Cycles 1-10, not represented in the above totals, read at slower speeds with the instrument operated manually.

Reading rate data was provided by the teacher for the forty-two children who had completed Readiness Stages and were in cycle placement in May. Six children were able to read Controlled Reader material only if the instrument was operated manually at a speed below the slowest dial setting (less than 60 words per minute).

Subject matter was considered by the teachers to be appropriate for first through fourth graders and student interest level was reported to remain high during the experimental period. The level of presentation was considered by the teachers to be too immature for fifth- and sixth-grade students and these children were assigned basal textbooks. It is recommended by Educational Developmental Laboratories that children of this age use the L-100 system or the higher cycles of LLL (41-100) for this reason.

Two of the teachers felt comfortable using the system and enjoyed the experience while one teacher felt overwhelmed by the system but still enjoyed using it. All three indicated that they would like to use the LLL system in essentially the same situation the following year. In fact, the system is being used during the 1968-69 school year in the same manner. Many of the students from the 1967-68 group were judged to be capable of achieving at normal rates following the laboratory experience and they were returned to regular classroom programs. New laboratory participants were selected as replacements. One child refused to take the end-of-year tests because she did not want to return to the classroom.

Parents of low-ability rather than underachieving children have sought enrollment of their children in the laboratory. Therefore, a summer school program for low-ability children is now planned for 1969.

V

THE LLL SYSTEM IN A SMALL RURAL AREA OF PENNSYLVANIA WITH UNDERACHIEVING CHILDREN

One LLL corrective installation was located in a small rural area of Pennsylvania. Children from both the LLL and control groups were second-grade children who were defined by the reading supervisor to be underachievers. The children selected for the LLL class had completed first-grade first-level basal materials during the first grade, ranged in IQ scores from 82 to 114, and had scored at lower quartile levels on the *Scott Foresman Inventory Test* administered in May, 1967. The control children from another school in the same district were essentially at the same reading level as the experimental group. Twenty-seven children were in the LLL class and twenty-five in the control class. The area could be considered one of educational deprivation; only two of the twenty-seven LLL children were rated as middle class on two of the three defining characteristics (education, income, and occupation of head of household), and three of the twenty-five control children were rated as middle class.

The LLL class began in late November, 1967. The entire class worked as a unit with no subgroupings from Readiness through Cycle 3. At this point three ability groupings were established in order that more capable children could work more rapidly through the cycles. By mid-April the range of cycles completed was from 29-34. The sequence of activities suggested in the Cycle Lesson Plans was followed explicitly except for the sections dealing with *Look and Write* activities. The teacher felt that the *Look and Write* materials would not be needed since the children had previously had more than a year's experience in printing. All poems and stories suggested in the Cycle Lesson Plans as supplemental materials were used if they were available in the school district and equivalent supplemental materials were substituted if the suggested readings were not available. Average time per day devoted to the language arts program was 180 minutes.

The control class, during an average 175 minutes per day, used the Scott Foresman, New Basic Readers Program as the basal program, and Phonetic Keys to Reading, published by Economy, as supplemental material to this basal series.

Four subtests of the *Stanford Achievement Test*, Primary I, and the *Cooperative Primary Tests*, Listening, were administered as pretests. These tests were administered again in May, 1968, as posttests. Analysis of this data was done utilizing Analysis of Covariance and a 2 x 2 (LLL or control by sex) factorial design. The covariate used was IQ score determined by the *Otis-Lennon Mental Ability Test* in order that the LLL and control groups could be statistically equated on any initial differences in ability. Table VII is a summary of the results obtained from this analysis.

TABLE VII

SUMMARY OF F-RATIOS AND ERROR MEAN SQUARES FOR THE ANALYSIS OF COVARIANCE[a] FOR FORTY-NINE CHILDREN TO WHOM THE STANFORD ACHIEVEMENT TEST, PRIMARY I, READING TESTS AND COOPERATIVE PRIMARY TESTS, LISTENING, WERE ADMINISTERED

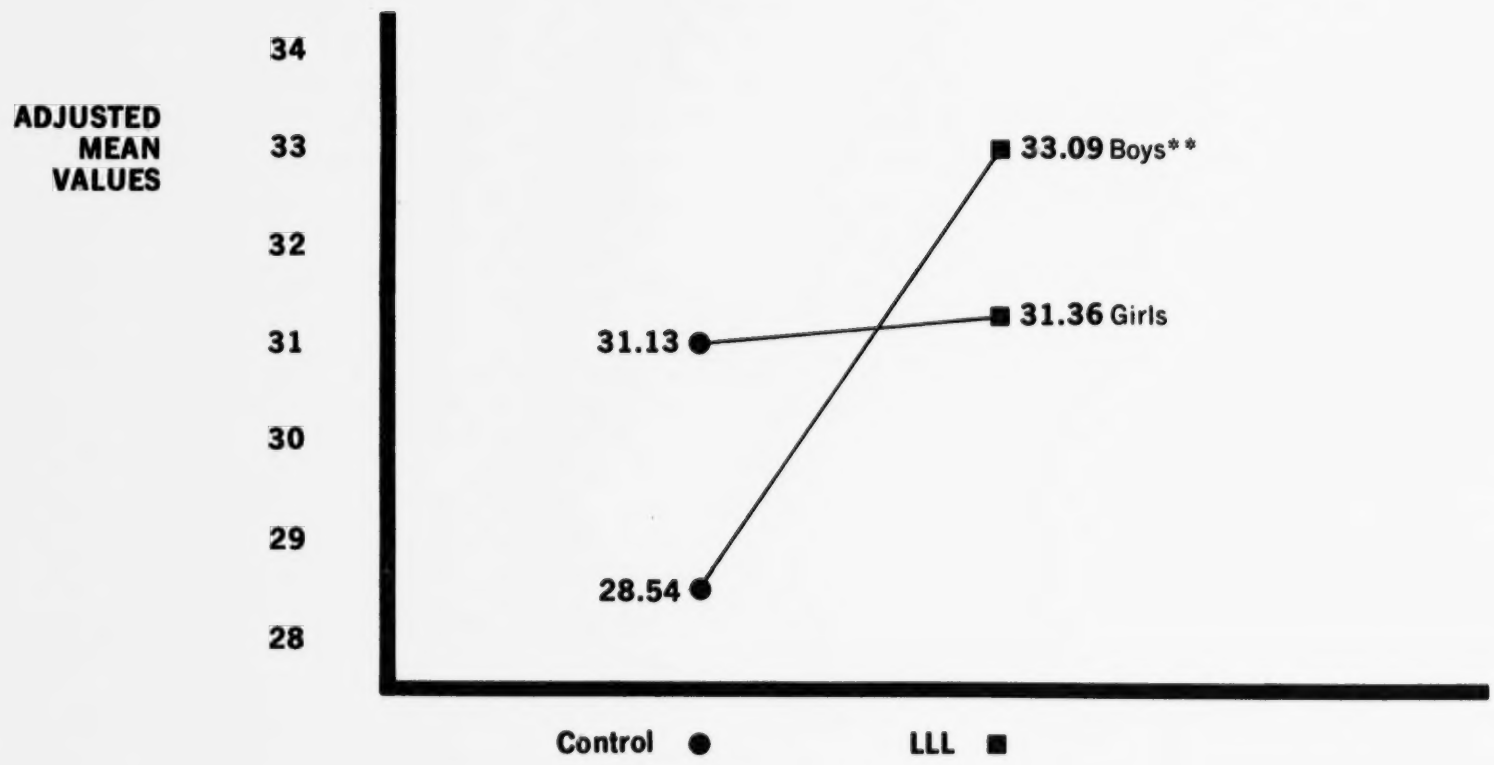
Source of Variation	df	Covariance Stanford Achievement Test Subtests: Word Reading	Covariance: Paragraph Meaning	Covariance: Vocabulary	Covariance: Word Study Skills	Covariance Cooperative: Listening
Treatment	1	6.72*	4.10*	.50	3.20	.08
Sex	1	3.21	4.81*	1.84	.18	1.94
Treatment x Sex	1	5.36*	7.97**	1.46	5.60*	7.65**
Error Mean Square	45	8.89	16.34	20.34	28.35	9.58

[a]**Otis-Lennon Mental Ability Test** administered in Fall, 1967

* $p < .05$ (probability of these results occurring by chance is five times in one hundred replications of the experiment)

** $p < .01$ (probability of these results occurring by chance is one time in one hundred replications of the experiment)

Column 3 gives the results of the analysis for the Word Reading subtest. The effects attributable to treatment (LLL or control) are significant ($p < .05$) and favor the LLL children. Figure 11 is a graphical representation of these results. Effects due to sex provided an F-ratio too small to be considered significant but the interaction effect of treatment by sex was significant ($p < .05$). This significant interaction is the result of the girls in the study scoring at essentially the same level for this subtest regardless of treatment, while the boys in the LLL group scored at a highly significant ($p < .01$) level above boys from the control group. The significant difference in achievement due to treatment effect appears to be attributable to the high level of achievement attained by LLL boys.



** LLL group favored at .01 level

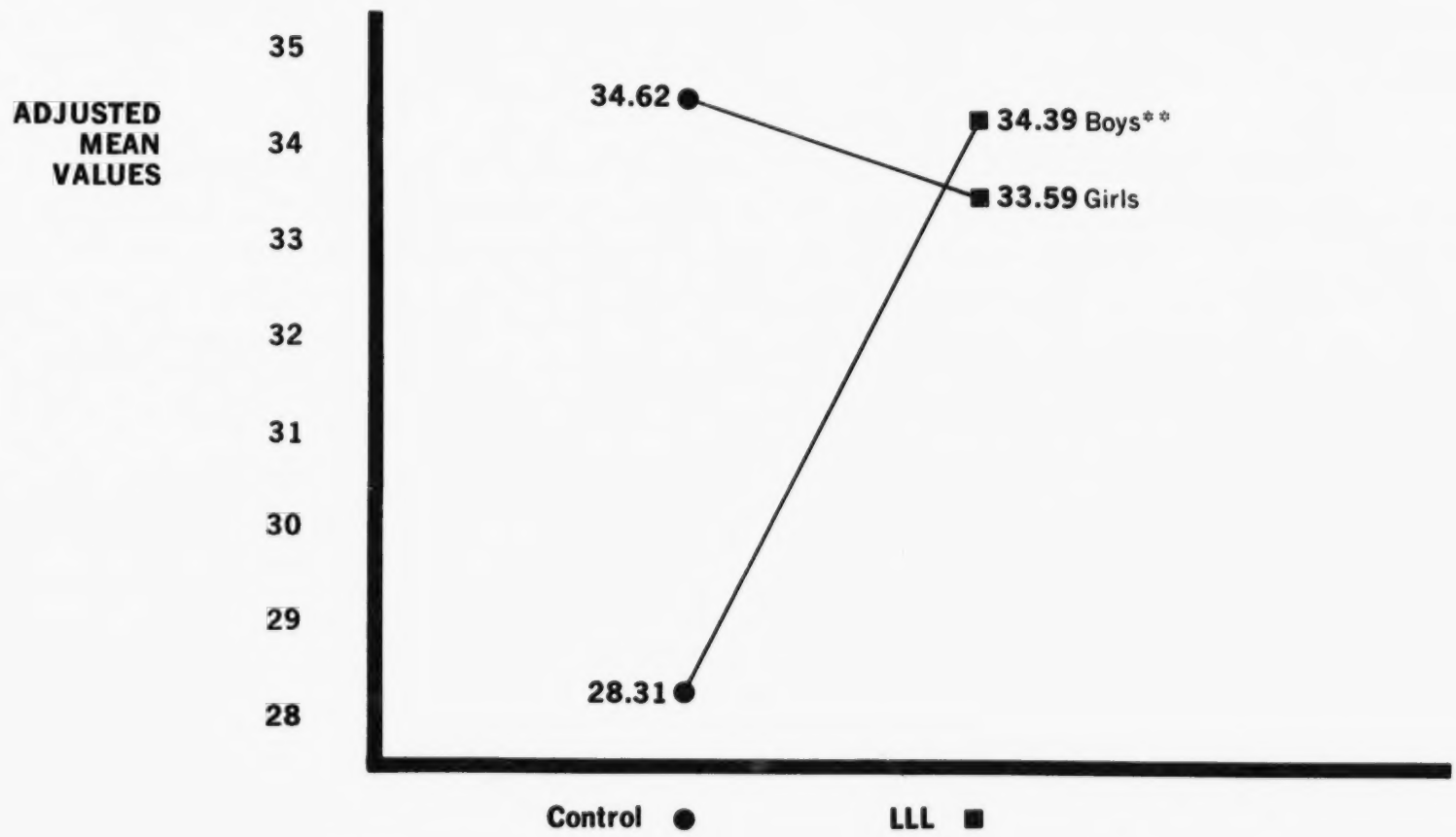
Graphical Representation of Achievement for the Word Reading Subtest of the Stanford Achievement Test, Primary I

Figure 11.

For the Paragraph Meaning subtest, column 4, Table VII, treatment effects, sex effects, and the treatment by sex interaction were all of a significant ($p < .05$ or $p < .01$) level. Figure 12 is a graphical representation of these results. When the results for boys and girls were pooled, there was a significant ($p < .05$) difference between LLL and control, favoring children from the LLL group. There was a highly significant difference between LLL boys and control boys and yet no statistical difference was found for girls from the two groups. This large difference exhibited by boys is responsible for the high F-ratios obtained for the sex and interaction sources of variation.

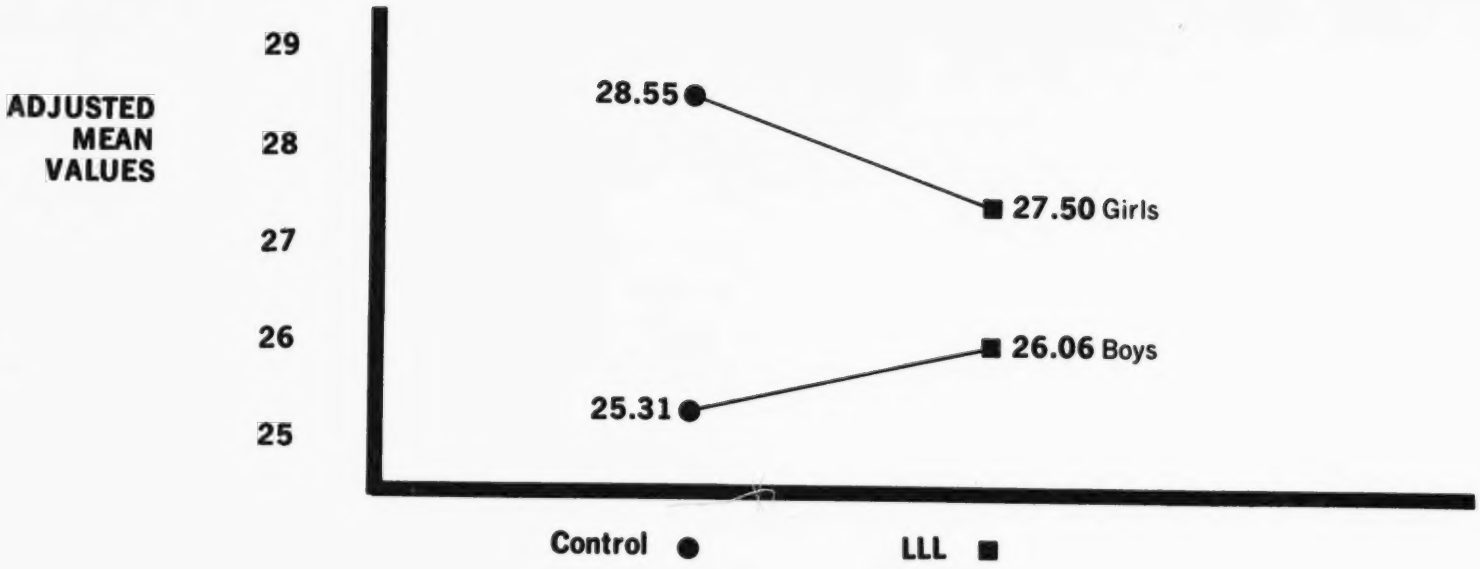
Column 5 of Table VII gives the F-ratios yielded by the analysis for the Vocabulary subtest. No significant differences were found for any sources of variation. Figure 13 is a representation of these results.

F-ratios for the results of the analysis for the Word Study Skills subtest are given in column 6. The ratio for treatment source of variation was slightly less than that required for significance and no differences due to sex were found to be significant. There was a significant interaction effect which can be seen in Figure 14. This interaction is the result of highly significant ($p < .01$) differences in boys' achievement favoring boys from the LLL group. Boys from the LLL class scored at a far higher level than did boys from the control class and yet there was no significant difference in level of achievement for girls from either class.



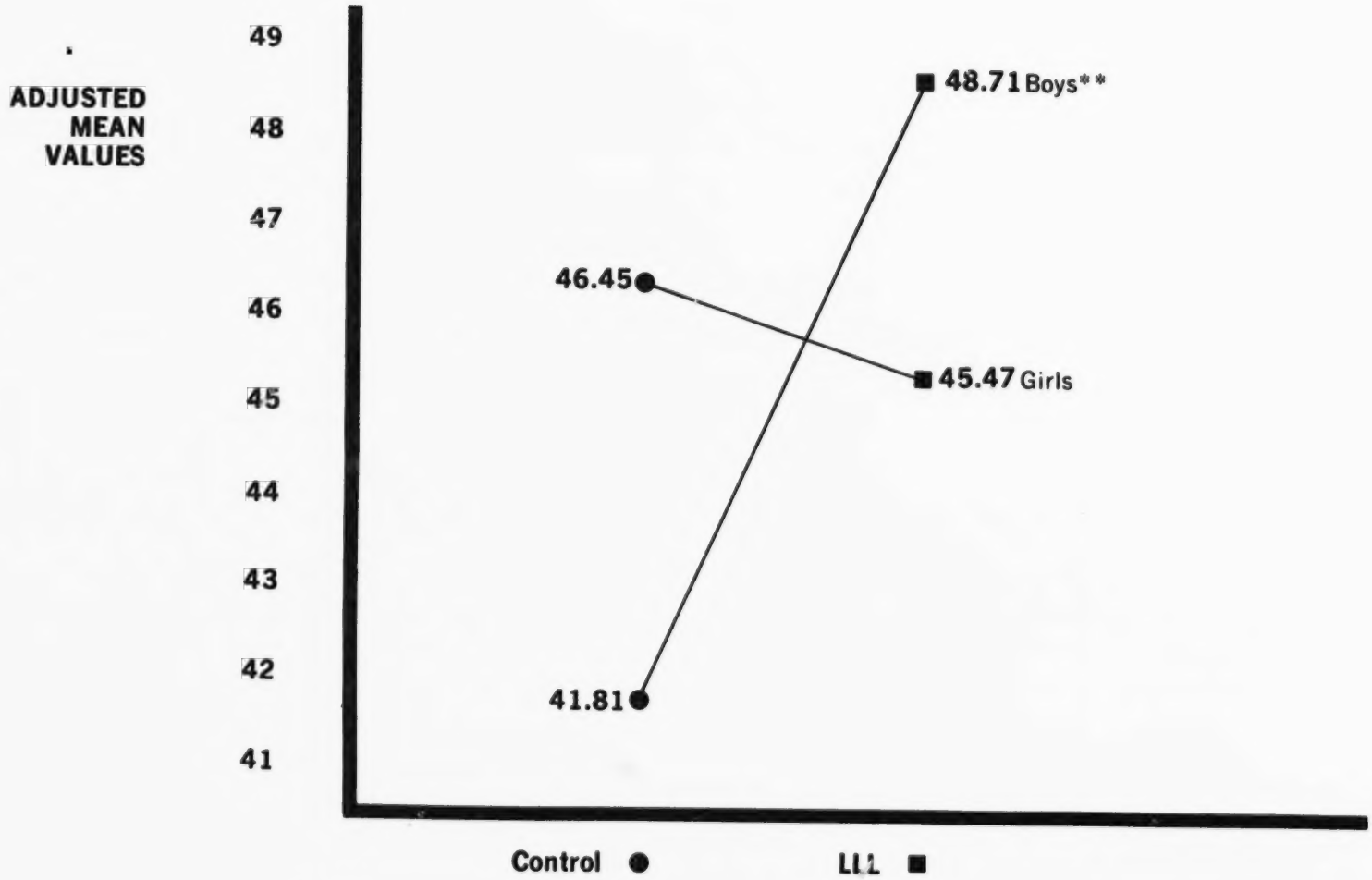
Graphical Representation of Achievement for the Paragraph Meaning Subtest of the Stanford Achievement Test, Primary I

Figure 12.



Graphical Representation of Achievement for the Vocabulary Subtest of the Stanford Achievement Test, Primary I

Figure 13.



** LLL group favored at .01 level

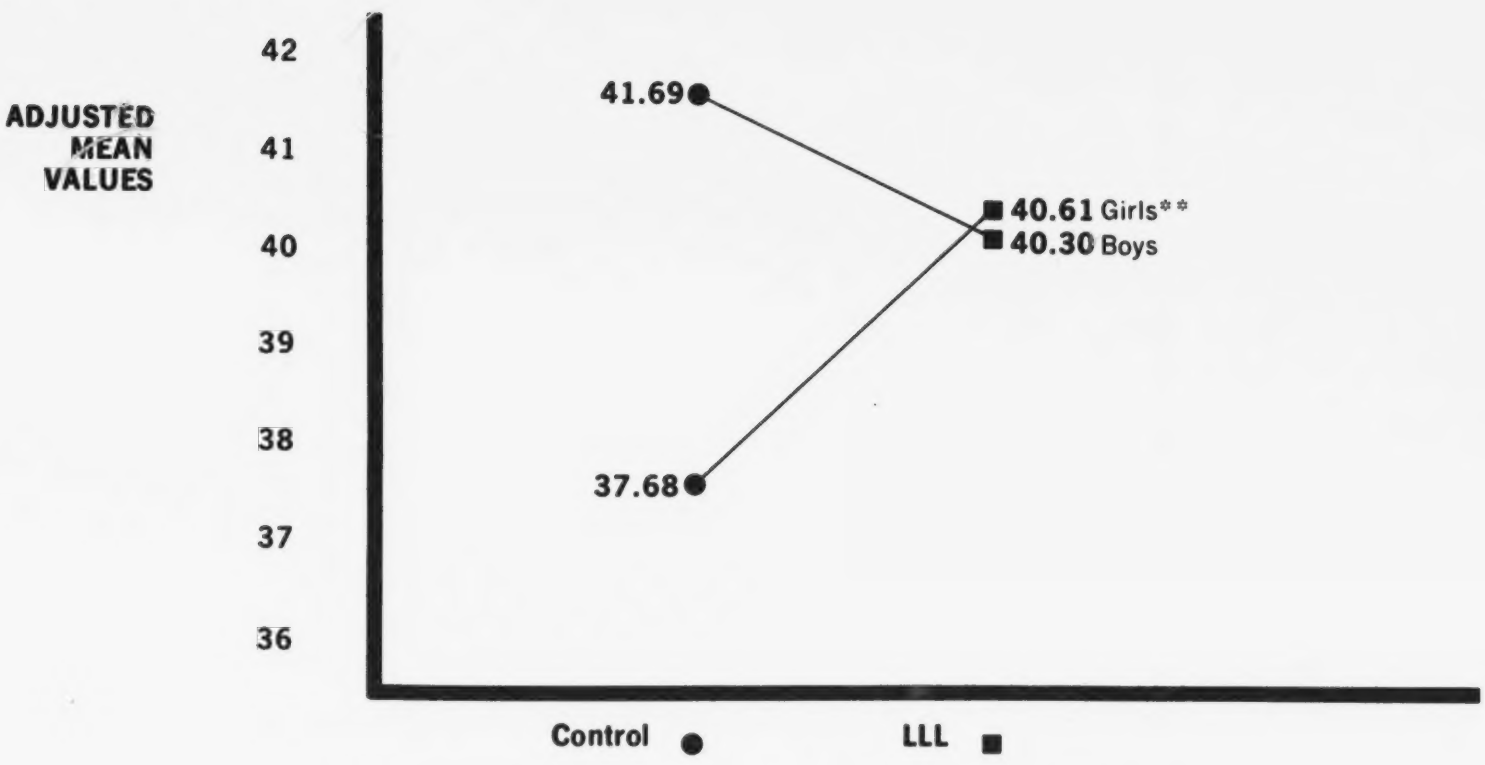
Graphical Representation of Achievement for the Word Study Skills Subtest of the Stanford Achievement Test, Primary I

Figure 14.

The last column of Table VII gives the results for the *Cooperative Primary Tests*, Listening. No significant differences were detected by this analysis for either treatment or sex, but the interaction effect of treatment by sex was significant ($p < .01$). Figure 15 is a graphical representation of these results. For this test, girls from the LLL class achieved at a highly significant ($p < .01$) level above girls from the control class. In contrast to the findings on three of the four *Stanford Achievement Test*, Primary I, subtests, LLL boys scored significantly higher than control boys.

The reading supervisor of this district was entirely satisfied with the results in the LLL classroom. She believed that the children benefited from the program and was particularly impressed with the manner in which students developed the habit of attending to auditory and visual stimuli. She stated that when they first began working in LLL cycles they looked toward an adult and waited for directions to be repeated to them but, as they progressed in the system, they developed a more independent approach and they were able to respond to directions without the direct supervision and help of an adult. The LLL system was selected by this district to be used with other underachieving students during the remedial summer school session and was to be used the following year in an average first-grade room.

In summary, the LLL system can be termed a success in this installation. The children appeared to maintain a high level of interest in the materials, the system was selected for use in summer school, and objective test results indicated that LLL children scored significantly above control children on two of the four subtests. Boys from the LLL group scored significantly above control boys on three of the four subtests and girls from LLL classes scored significantly higher than control girls on the Listening test.



** LLL group favored at .01 level

Graphical Representation of Achievement for the Cooperative Primary Tests, Listening

Figure 15.

VI

THE LLL SYSTEM IN A RURAL NEW ENGLAND SETTING

A research installation in a small city in New England tested the LLL system with an LLL class of twenty-five second-grade students. These children were considered to be emotionally disturbed, underachievers, or had serious behavior problems. Three of the children were rated as middle class according to occupation, income, and education of the head of the household, and the remainder were from the low socioeconomic status. Placement of children into this class was at the discretion of the classroom teachers.

Two groups from the same school district which the administrator felt to be similar in ability to the experimental class were available as control groups. The Scott Foresman series was used as the basal program and Phonetic Keys to Reading published by Economy was used as supplemental material by the control groups.

The lowest group in the LLL class began working in the LLL Readiness Stages. The middle group began with Cycle 1, a pre-reading level. The top group (six children) used the same basal materials as the children in control groups. Group placement within the experimental class was determined by the Scott Foresman end-of-book reading tests at the end of grade one. The children using the LLL system used all parts of the system except *Listen and Write*. The sequence and materials presented in the Teacher's Guide were closely followed by the teacher. An average of 24.8 LLL cycles was completed by these children, representing a range of 20-29 cycles.

The two groups which used LLL materials within the experimental class remained intact throughout the year. The teacher found that the Aud-X lessons required supervision. She stated as the reasons for this need the fact that the groups were large

(nine and ten students during an Aud-X lesson) and that the disciplinary problems within the groups needed constant adult supervision. The teacher used no materials supplementary to the LLL system because she felt the system to be very comprehensive.

This teacher judged the LLL system as having the greatest appeal for low-ability students. The children's interest in the use of the instruments was high and remained high throughout the year. One Aud-X was defective and was replaced by EDL but, in general, the Aud-X was considered to be dependable. This teacher judged the LLL system to be superior to other reading programs with which she had previous experience and, although she had felt overwhelmed by the system and had had serious problems with the defective instrument prior to its replacement, she stated that she enjoyed using the system and would like to use it again the following year. The specific strength of the system mentioned by her was the appeal to this type of child of the multimedia, multimodal approach to learning.

The children who used the LLL system were essentially non-readers although they were second graders. Ten of the children were placed in Readiness Stages rather than even in the pre-reading stages.

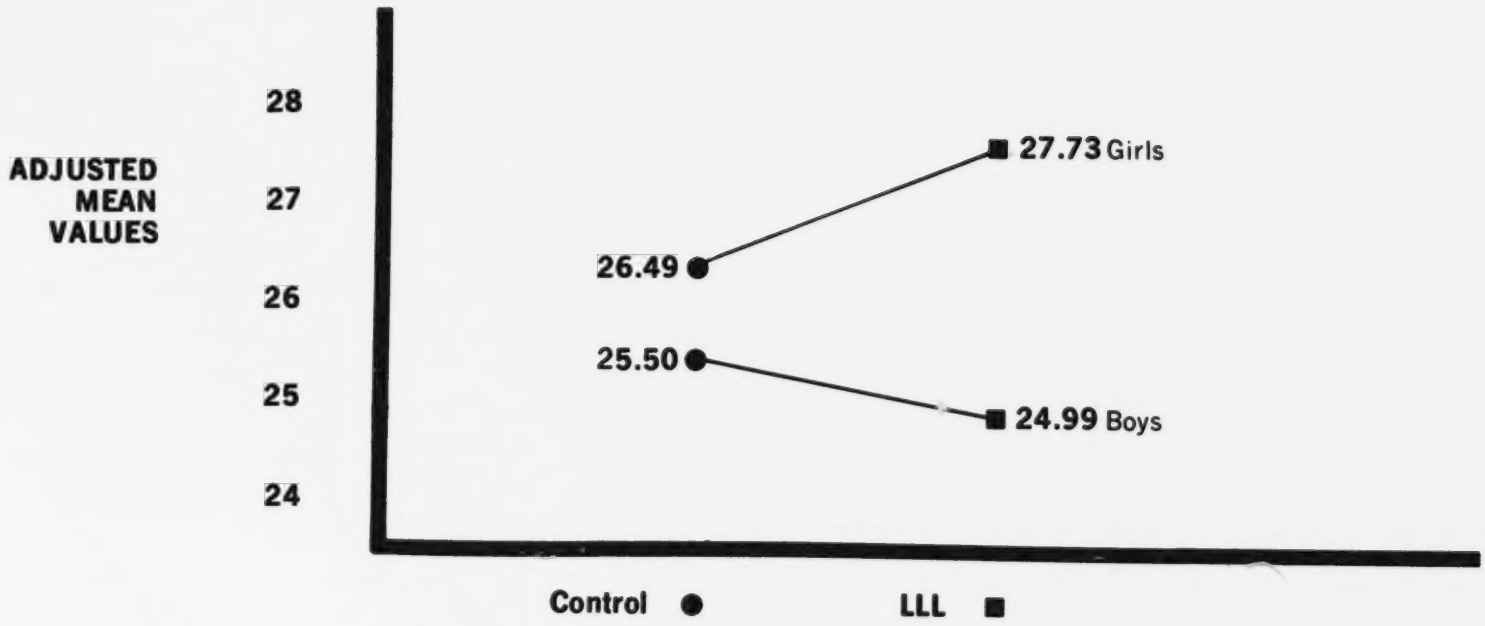
Special instruction for these children, both LLL and control, was continued for approximately four months. At the end of this period, the subtests of the *Stanford Achievement Test*, Primary I, and the *Cooperative Primary Tests*, Listening, were administered to the entire sample as posttests. Table VIII is a summary of these results. No significant results were detected by this analysis for any of the subtests or the Listening test. Graphical representations of growth during the four-month period were prepared and are provided in Figures 16 through 20. If these graphs are examined, it can be seen that children who used the LLL materials showed as good or slightly better growth patterns than control children. One problem encountered with a sample of this type is the lack of similarity of the experimental and control groups. The fact that children selected to use the LLL system were defined to be emotionally disturbed or disciplinary problems may have had some unmeasurable effect upon the analysis of data from this installation.

TABLE VIII

SUMMARY OF F-RATIOS AND ERROR MEAN SQUARES FOR THE ANALYSIS OF COVARIANCE[a] FOR SIXTY CHILDREN TO WHOM THE STANFORD ACHIEVEMENT TEST, PRIMARY I, READING TESTS AND COOPERATIVE PRIMARY TESTS, LISTENING, WERE ADMINISTERED

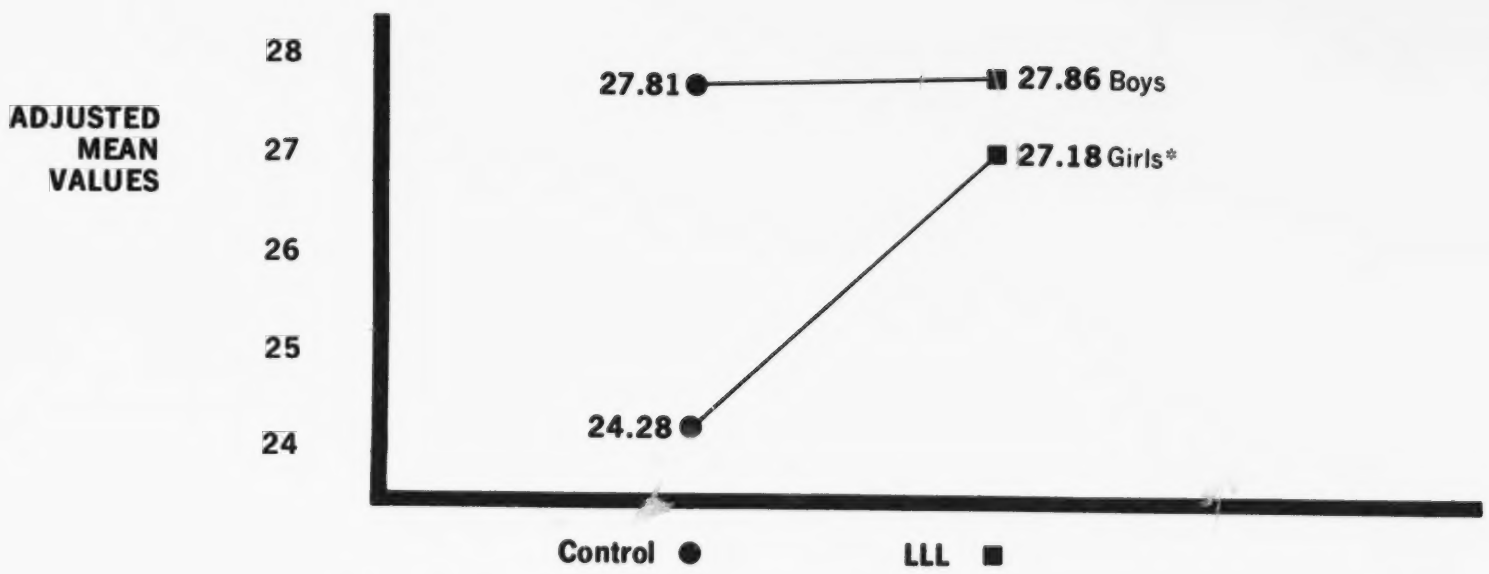
		Covariance	Covariance	Covariance	Covariance	Covariance
		Stanford Achievement Test Subtests				Cooperative
Source of Variation	df	Word Reading	Paragraph Meaning	Vocabulary	Word Study Skills	Listening
Treatment	1	.20	.26	.04	1.00	.27
Sex	1	1.51	.58	2.16	2.33	.01
Treatment x Sex	1	.04	.29	.53	.89	.03
Error Mean Square	53	44.43				
	53		90.73			
	54			22.90		
	54				76.60	
	56					23.03

[a] Pintner-Cunningham Primary Test administered in Fall, 1967.



Graphical Representation of Achievement for the Word Reading Subtest of the Stanford Achievement Test, Primary I

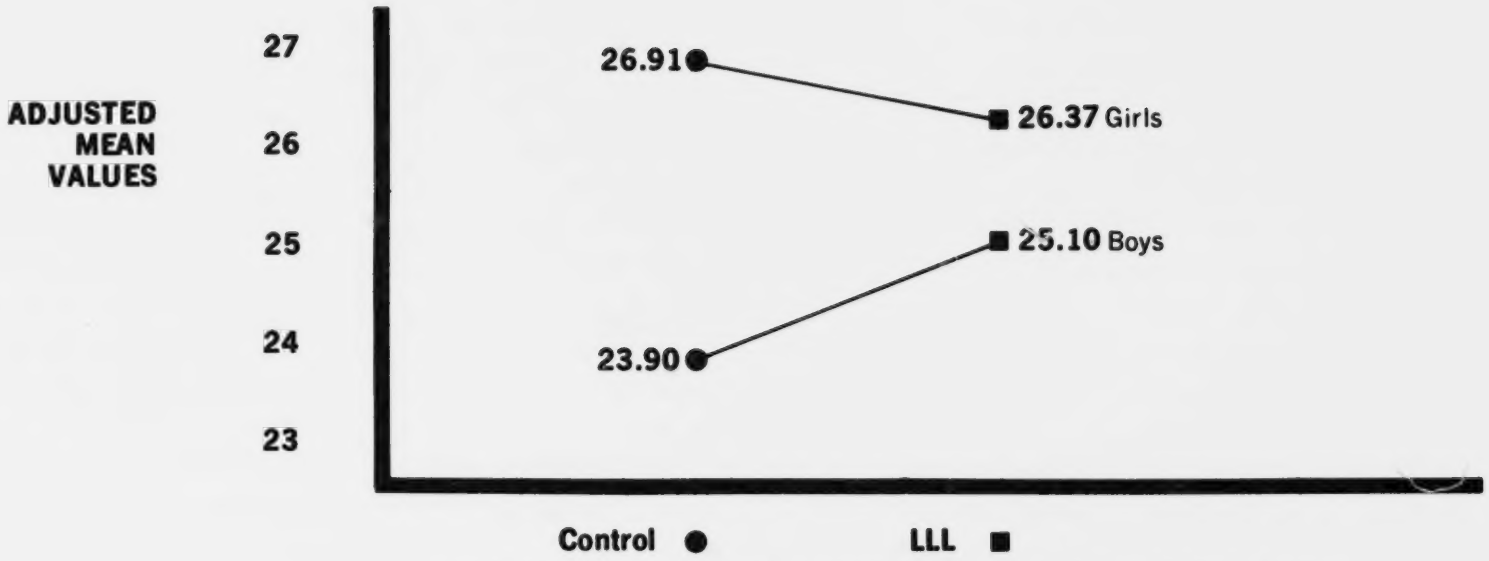
Figure 16.



* LLL group favored at .05 level

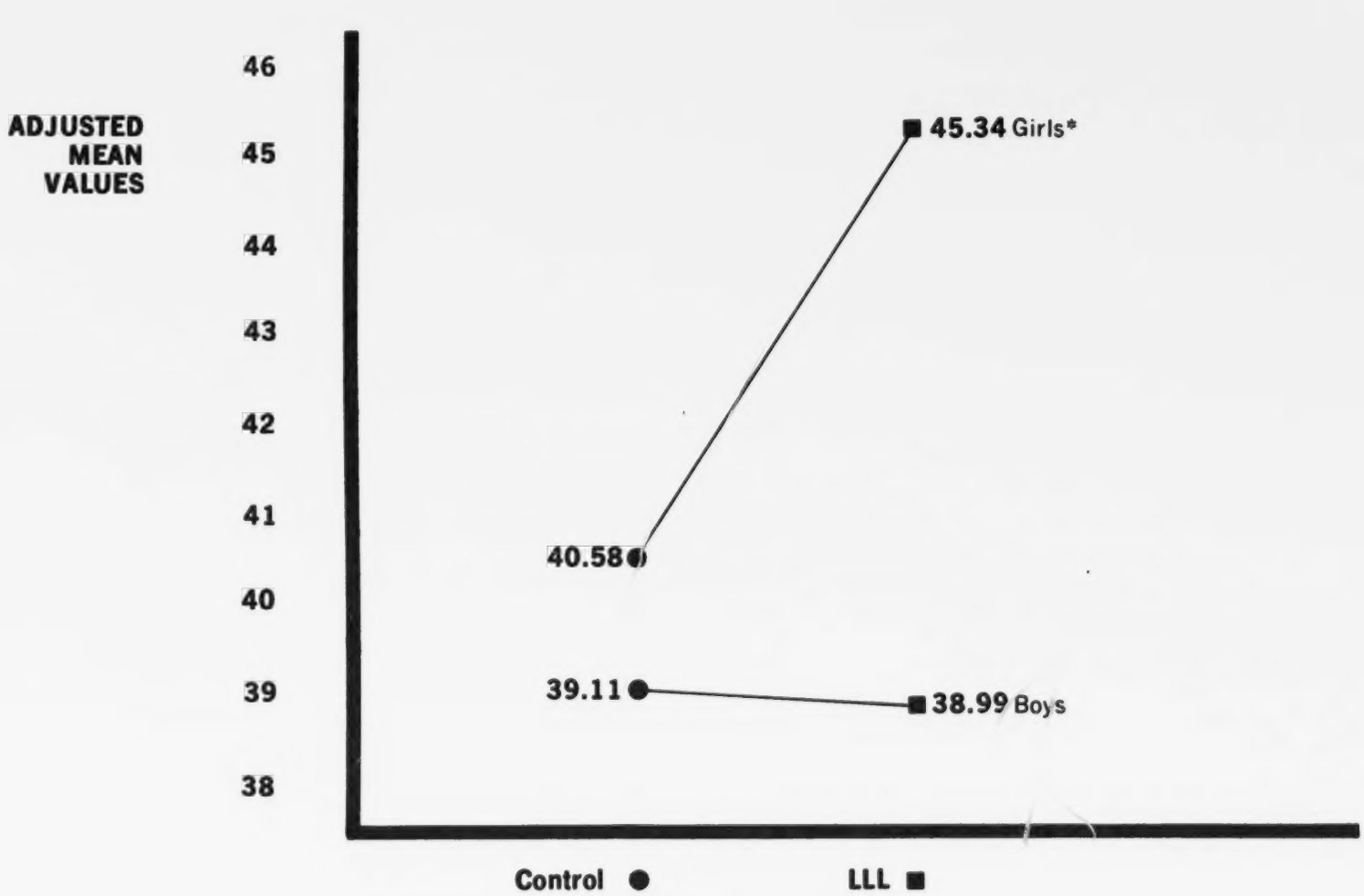
Graphical Representation of Achievement for the Paragraph Meaning Subtest of the Stanford Achievement Test, Primary I

Figure 17.



Graphical Representation of Achievement for the Vocabulary Subtest of the Stanford Achievement Test, Primary I

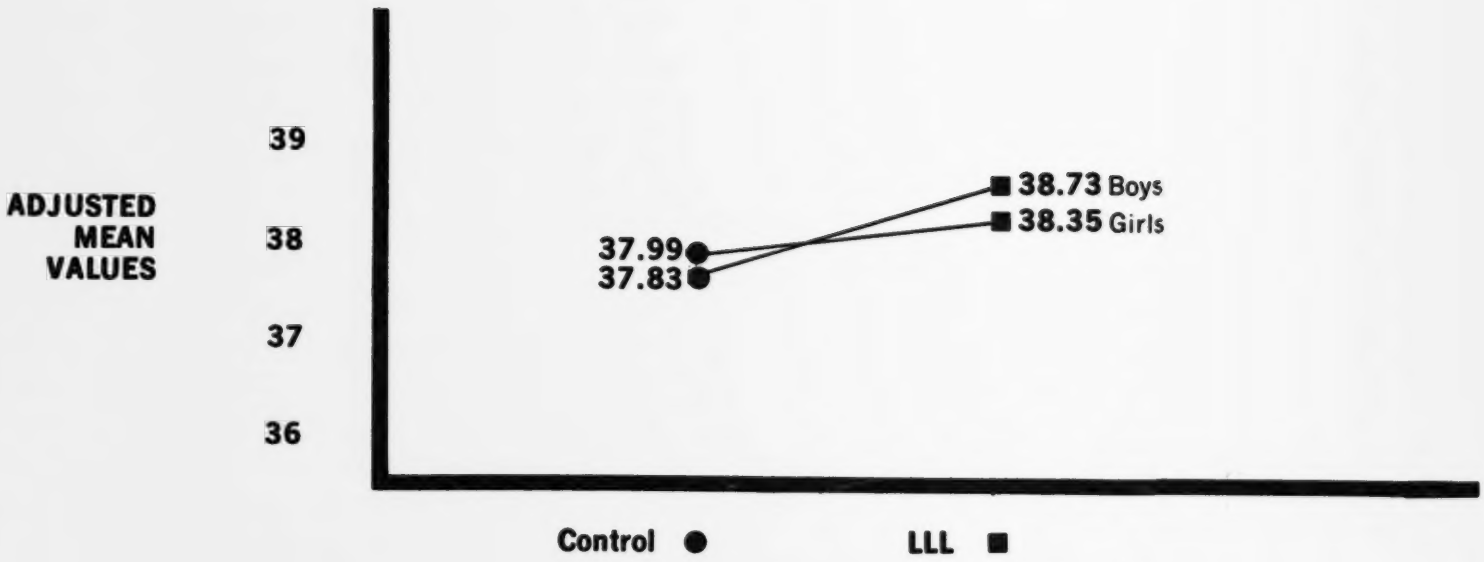
Figure 18.



* LLL group favored at .05 level

Graphical Representation of Achievement for the Word Study Skills Subtest of the Stanford Achievement Test, Primary I

Figure 19.



Graphical Representation of Achievement for the Cooperative Primary Tests, Listening

Figure 20.

VII

THE LLL SYSTEM IN A READING LABORATORY INSTALLATION IN AN EDUCATIONALLY DISADVANTAGED AREA

One LLL remedial and corrective installation consisted of a reading laboratory in a small city in southeastern Texas. The population of the school was entirely Negro and the area was classified as educationally deprived. The children selected for special help in the reading laboratory were judged to be of the lower socioeconomic status according to levels of education, income, and occupation of the head of the household. One child of the total sample was considered to be from the middle socioeconomic group. The

school district has become more concerned and more involved with experimental approaches to solving existing educational problems. The children selected for this reading laboratory were, in general, not responsive to the school and the learning environment of the classroom. Many of them appeared to be withdrawn and often retreated from the situation by being completely silent.

Selection of students for reading laboratory participation was a matter of classroom teacher choice. All of the students selected were considered to be one or more years below grade level in reading and in need of special help in this area. The children in the laboratory received no reading instruction other than that presented in the laboratory. The teacher involved used selected duplicated parts of the *Thinking Skills* materials published by Continental Press, Inc. and *Starting to Read* published by Milliken Publishing Company as materials supplemental to the LLL system. The teacher also used many objects such as ice skates and flower bulbs in an attempt to build experiences for these children. Apparently, their background of experience was extremely meager even though these were first- through fifth-grade students. Many library books were brought into the room to give the children the experience of physically handling books. Magazines were provided by the teacher and the children were allowed to cut out pictures and make scrapbooks of their own. Pictures of animals and filmstrips of the Natural Science Library were used to acquaint the children with previously unknown types of animals. The teacher often went to the playground with these children during recess to teach them games and it was necessary to use finger games and even finger painting to develop better fine-motor coordination.

Seventy-eight children were in the reading laboratory during the nineteen-week period but only fifty students participated in both pretest and posttest administrations. Absence, attrition resulting from student mobility, and late entrance into the reading laboratory were responsible for this sample loss. These fifty students had to be further divided according to the level of the test appropriate to their age category. For this reason, sample sizes are small and, therefore, not as generalizable or as valid as they would have been if a larger sample had been available. Tables IX, X, and XI provide a summary of the results obtained for the three levels of tests required for the sample. Each table should be examined separately.

Table IX indicates growth patterns were consistent for first- and second-grade students who took the *Stanford Achievement Test*, Primary I, although increase in achievement levels was not as great as in other age ranges. For each subtest except the Vocabulary subtest, the change in scores between pretest and posttest was a significant one which means that the change represented something other than chance fluctuation of scores. The Paragraph Meaning subtest which reflects the least amount of growth with respect to grade equivalent change did show a significant change in raw scores achieved by the children. It should be noted that a very large change in raw score must occur at the lower end of the conversion table for grade equivalents on the Paragraph Meaning subtest of the *Stanford Achievement Tests* to be reflected in increased grade equivalency. It should also be noted that this sample was quite small (nine students), and cannot be considered to be a reliable estimate for this reason.

TABLE IX

SUMMARY OF CHANGE SCORES ATTAINED BY NINE CHILDREN IN THE LISTEN LOOK LEARN READING LABORATORY ON THE STANFORD ACHIEVEMENT TEST, PRIMARY I, READING TESTS AND COOPERATIVE PRIMARY TESTS, LISTENING, DURING A NINETEEN-WEEK PERIOD

	Stanford Achievement Test Subtests				Cooperative
	Word Reading	Paragraph Meaning	Vocabulary	Word Study Skills	Listening
Pretest (mean score)[a]	13.38	9.44	14.22	20.44	24.33
Posttest (mean score)[b]	17.55	13.77	18.33	28.11	29.22
Change in Grade Equivalents	3 mo.	1 mo.	2 mo.	3 mo.	
Change in Percentile Rank[c]					11th Percentile to 15th Percentile
t-test	3.35**	2.47*	1.73	3.31**	2.24*

[a]Administered in January, 1968.
[b]Administered in May, 1968.
[c]Corrected for fall and spring norms and test forms administered.
* $p < .05$ (probability of these results occurring by chance is five times in one hundred replications of the experiment)
** $p < .01$ (probability of these results occurring by chance is one time in one hundred replications of the experiment)

As shown in Table X, a larger and, therefore, more reliable sample was available from this installation of students who took the *Stanford Achievement Test*, Primary II subtests. The students from this sample showed entirely satisfactory growth changes of four to six months during the nineteen-week period. An incorrect level of the Listening

TABLE X

SUMMARY OF CHANGE SCORES ATTAINED BY TWENTY-FOUR CHILDREN IN THE LISTEN LOOK LEARN READING LABORATORY ON THE STANFORD ACHIEVEMENT TEST, PRIMARY II, READING TESTS AND COOPERATIVE PRIMARY TESTS, LISTENING, DURING A NINETEEN-WEEK PERIOD

	Stanford Achievement Test Subtests			Cooperative[a]
	Word Meaning	Paragraph Meaning	Word Study Skills	Listening
Pretest (mean score)[b]	12.16	15.96	22.83	
Posttest (mean score)[c]	14.79	21.52	27.56	
Change in Grade Equivalents	6 mo.	4 mo.	4 mo.	
t-test	4.50**	6.01**	4.92**	

[a]An incorrect level of this test was administered as a pretest and, therefore, computation of change scores would have been invalid.
[b]Administered in January, 1968.
[c]Administered in May, 1968.
** $p < .01$ (probability of these results occurring by chance is one time in one hundred replications of the experiment)

test was administered to this sample as a pretest which invalidated any analysis of Listening test results for these children. The change in scores between pretest and posttest exhibited for each *Stanford Achievement Test* subtest was highly significant ($p < .01$) which means it was not due to chance fluctuation of scores.

Table XI indicates that children who took the *Stanford Achievement Test*, Intermediate I subtests exhibited satisfactory growth patterns: gains of five and six months during the nineteen-week period. There were significant differences in scores between pretest and posttest on the *Stanford Achievement Test*. The Listening test change scores were not significant. This means that the Listening test scores achieved on pretest and posttests were the result of chance score fluctuation.

TABLE XI

SUMMARY OF CHANGE SCORES ATTAINED BY SEVENTEEN CHILDREN IN THE LISTEN LOOK LEARN READING LABORATORY ON THE STANFORD ACHIEVEMENT TEST, INTERMEDIATE I, READING TESTS AND COOPERATIVE PRIMARY TESTS, LISTENING, DURING A NINETEEN-WEEK PERIOD

	Stanford Achievement Test Subtests		Cooperative
	Word Meaning	Paragraph Meaning	Listening
Pretest (mean score)[a]	9.82	18.41	27.82
Posttest (mean score)[b]	13.00	22.34	29.00
Change in Grade Equivalents	5 mo.	6 mo.	
Change in Percentile Rank[c]			18th Percentile to 13th Percentile
t-test	3.47**	3.94**	1.59

[a]Administered in January, 1968.
[b]Administered in May, 1968.
[c]Corrected for fall and spring norms and test forms administered.
** $p < .01$ (probability of these results occurring by chance is one time in one hundred replications of the experiment)

The results of this objective evaluation of the data indicate that children of this population, educationally deprived and functioning at low achievement levels, are able to achieve at a satisfactory rate when they use the LLL system. Satisfactory, in this sense, means that they can increase their grade equivalent scores at a rate equal to or greater than normal expectancy. Much has been written to suggest that, once a pattern of academic failure has been established, a child from this population begins to achieve less and less during the course of a school year in comparison with children of the so-called middle-class background. This effect is sometimes referred to as a cumulative deficit. Therefore, if the child from this population can develop at a normal rate, according to established norms, and is able to increase his achievement level at a level other than chance fluctuation of scores as a result of using the LLL system, then the system can be considered to be successful with the population.

The reading laboratory period was initially conducted during two class period time blocks but after a few weeks the laboratory period was reduced to one class period to reduce class size. This also allowed the children to be placed into the laboratory during

the time period during which they would normally be scheduled into reading classes without affecting their class schedules.

All aspects of the LLL system were used. The Picture Sequence Cards were used repeatedly by the children to increase their ability to communicate. They were distributed and discussed to the extent that the cards themselves became worn and frayed and had to be replaced. The Weston Woods filmstrips were repeated three or four times each. During the first viewing, the children watched the filmstrip in the regular manner. During the second viewing, the sound was turned down and the teacher provided the narrative. On the third and fourth viewing, the sound was again turned down and the teacher asked the children to explain each frame of the picture. She believed that this served the purpose of increasing verbal response facility in the children.

The teacher used the reinforcement sequence of the My Skills Sheets segment of the program in a slightly different way. If a particular skill was prerequisite to a skill to be taught, or if the teacher felt that review of a previously learned skill would facilitate acquisition of a new skill, she used the Reinforcement sheets for the prior skill as an introduction to the new skill. The Aud-X lessons were repeated the second time for most of the children through Cycle 3 and some children had to complete Aud-X lessons twice through Cycle 10. The teacher included all activities recommended in the Suggested Activities and found the Resource Materials source book to be of particular advantage.

Work groups of three to six children were established in the laboratory. Adult supervision of Aud-X lessons varied as a function of the level of cycle attainment by the children. In the Readiness Stages, adult supervision was always required; in Cycles 1 through 12 supervision was often required; and in Cycles 13 through 29 supervision was seldom required. The reasons that precipitated this need for supervision, according to the teacher, were related to the children's previously formed habits of inattention, lack of conforming behavior in group situations, extreme need for adult attention, and antisocial behavior problems. The teacher stated that although she felt overwhelmed by the system and often felt a time pressure, she enjoyed using the system. The system is, in fact, being used this year by the same teacher and with the same type of student. She had the benefit of one aide each day during the study and a high school student who was in the room for an hour a day and could assist in classroom management. The school administrator was extremely pleased with the results of the program. He stated that children whom he felt to be doomed to inevitable withdrawal because of continual patterns of failure were exhibiting signs of interest in reading and in all school subjects. The community reaction to the program is very good. The teacher of the laboratory has been asked by other schools in the area and by other interested groups to give workshops demonstrating the LLL system.

VIII

THE LLL SYSTEM IN AN UPPER-MIDDLE-CLASS AREA WITH UNDERACHIEVING CHILDREN

One corrective and remedial installation was of particular interest. It is often assumed that remedial groups are composed of children who have had fewer advantages with respect to economic condition and parental concern. This is not always true and this installation, located in an upper-middle-class suburb of a large southwestern city, is a case in point.

The area is composed of homes in the $40,000 to $80,000 range, the parents are generally well-educated and prosperous, and the school itself offers almost all of the modern facilities considered to constitute an ideal teaching-learning situation. The building itself is new, it is air-conditioned, the walls are moveable to allow for changing classroom structure, separate wings house different grade levels, closed circuit television has been installed and special materials and field trips are available. The organization of the classes is essentially non-graded.

With these near-ideal conditions, the problem of how best to help children who are underachievers, children who perform at a level far below expectancy, was still a serious one.

The principal of this school has been very interested in securing an educational program or system that would help these children achieve at normal levels. She was, therefore, very receptive toward a new approach, a new concept in instruction, as exemplified in the multimedia approach offered in the LLL system.

Two teachers, one inexperienced and one who had previously had five years of teaching experience, were selected to teach two groups of third-grade children who were selected as underachievers. The children selected were achieving below grade level but were in the normal to superior range on IQ tests and were considered to be immature with respect to their ability to work without continuous adult supervision. The classes were established independently and the motility training and experience building parts of the LLL system were conducted by the teachers with their individual groups. The major part of the LLL language arts program was done by the teachers in a team teaching situation. All skill building and reading accuracy training was done in this manner. This approach offered the distinct advantage of the availability of two professional adults in the classroom without the necessity of hiring a teacher's aide.

The Picture Sequence Cards were used in a manner which the teachers felt to be successful but which was slightly different than that suggested in the Cycle Lesson Plans. Small groups of children would each be given a set of the Picture Sequence Cards and each child would write a story. Then the children criticized each other and improved upon the story. This type of activity could serve to increase the child's written vocabulary as well as encourage his participation within the group.

Both groups completed all 40 cycles before the end of the year and read all Samplers and Carousel Books. After completing the cycles (near the end of the year), one group was given the basal textbooks to read with no specific assignment and the second group used listening tapes and supplementary readers. At the time school-wide basal achievement tests were administered, the two LLL groups were included in the testing even though only one of the groups had read parts of the basal text. Both groups scored at levels above the average. This may be an indication that little adjustment is required of children who, for a variety of reasons, must return to basal materials after working in the LLL system.

Table XII gives test values and change between pretest and posttest scores during the six-month period. The children were able to increase achievement levels at an essentially normal rate during this time for the three subtests of the *Stanford Achievement Test*, Primary II. The computed t-test values for pretest and posttest scores for these three subtests indicate that the amount of change was such that it could have occurred by chance only one time in one hundred experiments. No significant change in pretest and posttest scores was detected by this analysis for the Listening test. It should be noted, however, that the Listening tests were in short supply due to error and the ten highest achieving students were not tested.

TABLE XII
SUMMARY OF CHANGE SCORES ATTAINED BY FIFTY-FOUR CHILDREN ON THE STANFORD ACHIEVEMENT TEST, PRIMARY II, READING TESTS AND COOPERATIVE PRIMARY TESTS, LISTENING, IN TWO SUBURBAN INSTALLATIONS WHICH USED THE LLL SYSTEM DURING A SIX-MONTH PERIOD

	Stanford Achievement Test Subtests			Cooperative
	Word Meaning	Paragraph Meaning	Word Study Skills	Listening
Pretest (mean score)[a]	20.85	35.02	38.48	35.04
Posttest (mean score)[b]	25.72	41.06	43.43	37.70
Change in Grade Equivalents	6 mo.	5 mo.	6 mo.	
Change in Percentile Rank[c]				55th Percentile to 59th Percentile
t-test	9.29**	9.17**	6.32**	1.02[d]

[a]Administered in November, 1967.
[b]Administered in May, 1968.
[c]Corrected for alternate forms and fall and spring norms
[d]Forty-four children took the **Cooperative Primary Tests**, Listening.
** $p < .01$ (probability of these results occurring by chance is one time in one hundred replications of the experiment)

The two teachers of these groups responded to questionnaires during the experimental period. Each teacher had one Aud-X available for her class but since these lessons were presented during team teaching, two instruments were available to the total group. The teachers reported that the children were able to proceed with the Aud-X lessons under the direction of student monitors and seldom required adult supervision. One class was divided into five reading groups and the second class into six reading groups which meant that eleven possible groupings were available to the children which provided very flexible cycle placement. Approximately two hours per day were devoted to the language arts program. Both teachers stated that they believed the LLL system to have the greatest appeal for low-ability children. (This could be suggested to mean underachieving children in this installation.) The children were initially interested in the system, the use of the instruments, and the content of the materials, and this interest remained high throughout the experiment. Both teachers rated the system as superior to any other language arts program with which they had prior experience.

In summary, it can be stated that the LLL system was successful in this installation and did provide this school with an educational system that served the desired purpose. Third-grade underachieving students developed independence with respect to their school work, they showed new interest in reading and learning, and they were able to achieve at essentially normal growth levels. The teachers felt that the system was manageable in a team teaching situation and mentioned as strengths of the system the specific visual training, increase of independent study habits in the children, and the variety of activities provided. One of the teachers offered, as a suggestion for improvement, that the system be extended vertically and to additional subject areas. The only other suggestion was for extended response time before instrument feedback is given to the children. This might allow for more time for the children to choose the correct response.

IX

SUMMARY

A total of two hundred and ninety-eight children defined as corrective and remedial were in LLL classes during 1967-68. One hundred and four children of a similar type, according to the cooperating school administrators, were available as controls and were in classes which used basal materials.

The largest group of children, and the group for which reasonably appropriate controls were available, were first- and second-grade children who took the reading subtests of the *Stanford Achievement Test*, Primary I, and the *Cooperative Primary Tests*, Listening. For this sample, treatment effect (LLL or basal reading group) was a significant effect favoring LLL children for three of the four subtests of the *Stanford Achievement Test*. Reading ability, defined as above or below the sample median, showed a significant difference on all four subtests and favored those children above the median level. There was a significant difference due to sex and favoring girls for three of the four subtests. The following results from this analysis should be noted:

1. For the Word Reading subtests, both girls and boys from LLL classes scored at a significant level ($p < .05$) above control girls and boys. LLL children who scored above the sample median in reading ability scored at a highly significant level ($p < .01$) above control children with corresponding reading ability. See Table I and Figure 1, pages 4 and 6.

2. For the Paragraph Meaning subtest, girls from LLL classes scored at a significant level ($p < .05$) above girls from the control classes. Girls and above-median readers were significantly different than boys and below-median readers for this subtest. See Table I and Figure 2, pages 4 and 7.
3. For the Vocabulary subtest, girls from LLL classes scored at a highly significant ($p < .01$) level above girls from control classes. Both above- and below-median reading ability children from LLL groups scored significantly higher ($p < .01$) than corresponding children from control classes. See Table I and Figure 3, pages 4 and 8.
4. For the Word Study Skills subtest, boys from LLL classes scored significantly higher than boys from control classes. Above-median reading ability children and girls were favored for this subtest. See Table I and Figure 4, pages 4 and 9.
5. No significant differences for the *Cooperative Primary Tests*, Listening, were detected by this analysis. See Table I and Figure 5, pages 4 and 10.

Each corrective and remedial installation was analyzed separately. The following results from these analyses should be noted:

1. Inner City Disadvantaged Area
   a. Significant differences in achievement ($p < .01$) favoring children from the LLL group were found for two of the *Stanford Achievement Test*, Primary I, Reading Tests and for the *Cooperative Primary Tests*, Listening. See Table II, page 12.
   b. Boys from the LLL class scored significantly higher than boys from the control group for the Word Reading, Paragraph Meaning, and Vocabulary subtests and for the Listening test. See Figures 6, 7, 8, and 10, pages 13, 14, 15, and 17.
   c. Girls from the LLL class scored significantly higher than girls from the control class for the Vocabulary subtest. See Figure 8, page 15.
   d. On a locally required and administered test, LLL children scored at an average of 2.7 (range of 1.8 to 3.8 grade equivalency) on Word Knowledge and an average of 4.2 (range of 3.2 to 5.6 grade equivalency) on Paragraph Meaning. The city-wide expectancy values were 2.8 at the time of administration of this test. See page 18.
   e. Both the teacher of the LLL class and the school principal were well pleased with the positive attitudinal and motivational changes exhibited by the students and also by the parents of the students. See page 19.
2. Reading Laboratory Installations in Louisiana
   a. First- and second-grade children exhibited growth of four to six months on the *Stanford Achievement Test*, Primary I, Reading Tests, during a twenty-two week period of use of the LLL system. The percentile rank on the *Cooperative Primary Tests*, Listening, changed from the 12th to the 53rd during this period. See Table IV, page 22.
   b. Third- and fourth-grade children exhibited growth of four to six months on the *Stanford Achievement Test*, Primary II, Reading Tests, and a percentile rank change from 9th to 45th during a twenty-two week period of use of the LLL system. See Table V, page 23.
   c. Average or above-average growth for children of this population, defined as underachievers, can be considered entirely satisfactory. Children of this type often exhibit less than month-to-month growth patterns even considering the effect of sample regression. See page 22.
   d. The three reading laboratory teachers were satisfied with both cognitive and affective growth of the children and wanted to continue LLL system use. See page 23.

3. Rural Pennsylvania Area
   a. Significant differences favoring LLL children were detected for two of the four *Stanford Achievement Test*, Primary I, Reading Tests. See Table VII, page 26.
   b. Treatment by sex differences were detected for three of the four subtests and the *Cooperative Primary Tests*, Listening. The interactions resulted from different levels of achievement for boys and girls from the LLL class. See Table VII and Figures 11, 12, 14, and 15, pages 26, 27, 28, 29, and 30.
   c. On the Word Reading subtest, LLL boys scored at a highly significant ($p < .01$) level above boys from the control class. See Figure 11, page 27.
   d. On the Paragraph Meaning subtest, LLL boys scored at a highly significant ($p < .01$) level above boys from the control class. See Figure 12, page 28.
   e. On the Word Study Skills subtest, boys from the LLL class scored at a highly significant ($p < .01$) level above boys from the control class. See Figure 14, page 29.
   f. On the Listening test, girls from the LLL class scored at a highly significant ($p < .01$) level above girls from the control class. See Figure 15, page 30.
   g. The reading supervisor was well pleased with both cognitive and affective growth of the students. Increased attention to both auditory and visual stimuli and an increase in the children's ability to work independently was specifically mentioned. See page 30.
4. Emotionally Disturbed, Underachievers, and Behavior Problems in a Rural New England Area
   a. No significant differences were detected on the *Stanford Achievement Test*, Primary I, Reading Tests, or for the *Cooperative Primary Tests*, Listening, by this analysis. See Table VIII, page 32.
   b. For the Word Study Skills subtest, girls from the LLL class scored at a significant ($p < .05$) level above girls from the control class. See Figure 19, page 34.
   c. The LLL cooperating teacher was well satisfied with the level of student interest in the LLL materials and in the instruments. See page 32.
   d. The cooperating teacher believed the multimedia, multimodal approach to be of value for this type of child. See page 32.
5. A Reading Laboratory in an Educationally Deprived Area
   a. First- and second-grade children exhibited one to three months' growth during a nineteen-week period of LLL system use. See Table IX, page 39.
   b. Third- and fourth-grade children exhibited four to six months' growth during a nineteen-week period of LLL system use. See Table X, page 39.
   c. Fifth-grade children exhibited a five to six months' growth during a nineteen-week period of LLL system use. See Table XI, page 40.
   d. The LLL cooperating teacher and the school administrator were well pleased with the cognitive and affective results achieved. The reading laboratory was to be continued the following year. See page 41.
6. Underachieving Children in an Upper-Middle-Class Area
   a. The children in this installation exhibited five to six months' growth during the six-month period of LLL system use. See Table XII, page 45.
   b. These children, characterized as immature by the cooperating teachers, developed the ability to work effectively in small groups with student monitors rather than demanding adult supervision as they had previously. See page 45.